

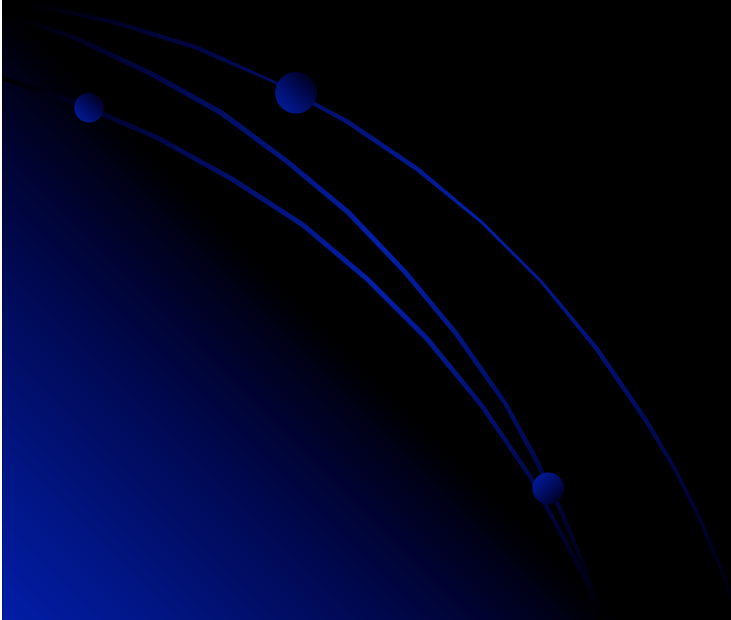
The Biceps Tendon: Pathology and Treatment

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Centre for Arthroscopic and Shoulder
Surgery IASO General Hospital
Athens, Greece

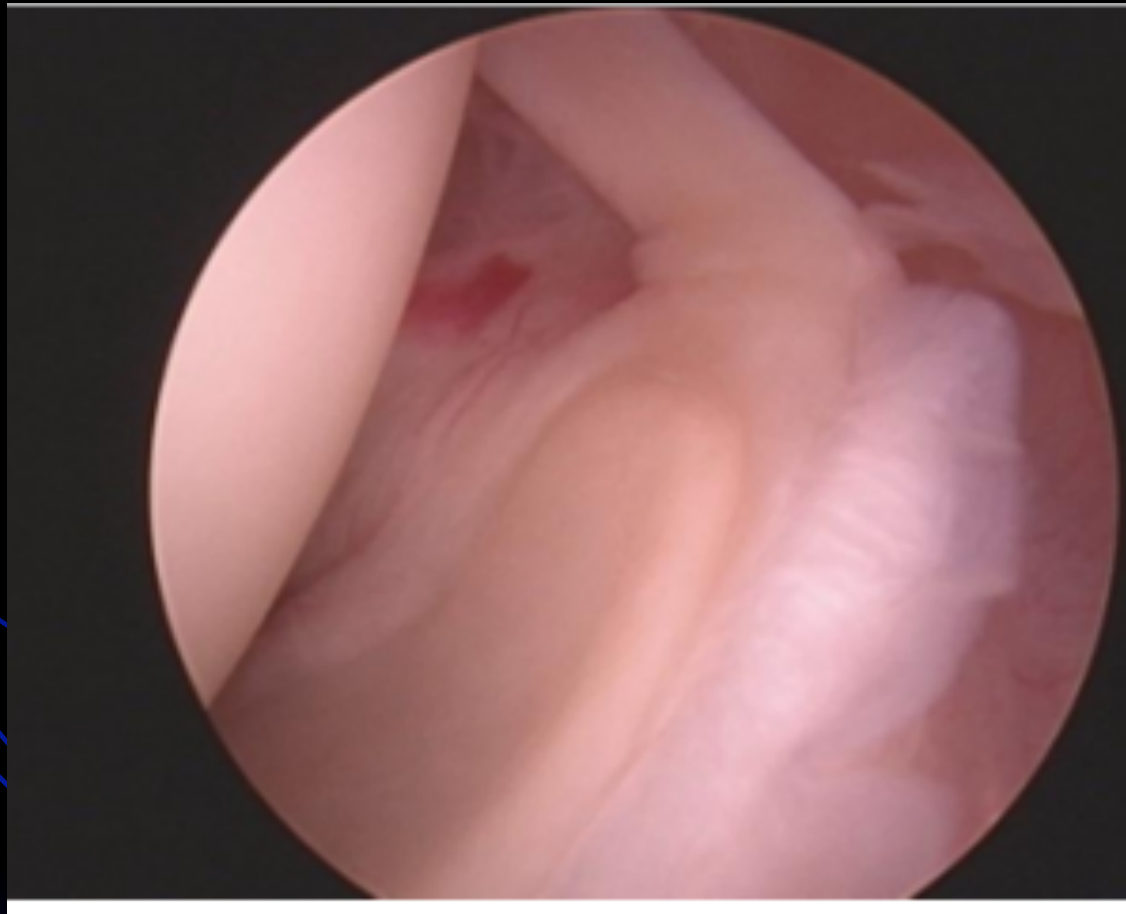
Hybris ὕβρις

Actions who challenged the gods or their laws resulting in the protagonist's downfall.



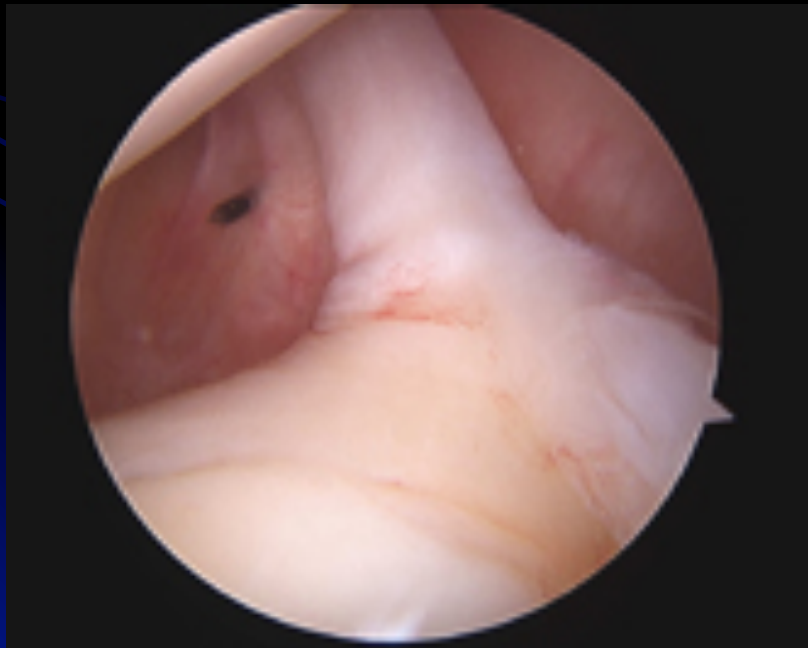


Normal Biceps Anchor

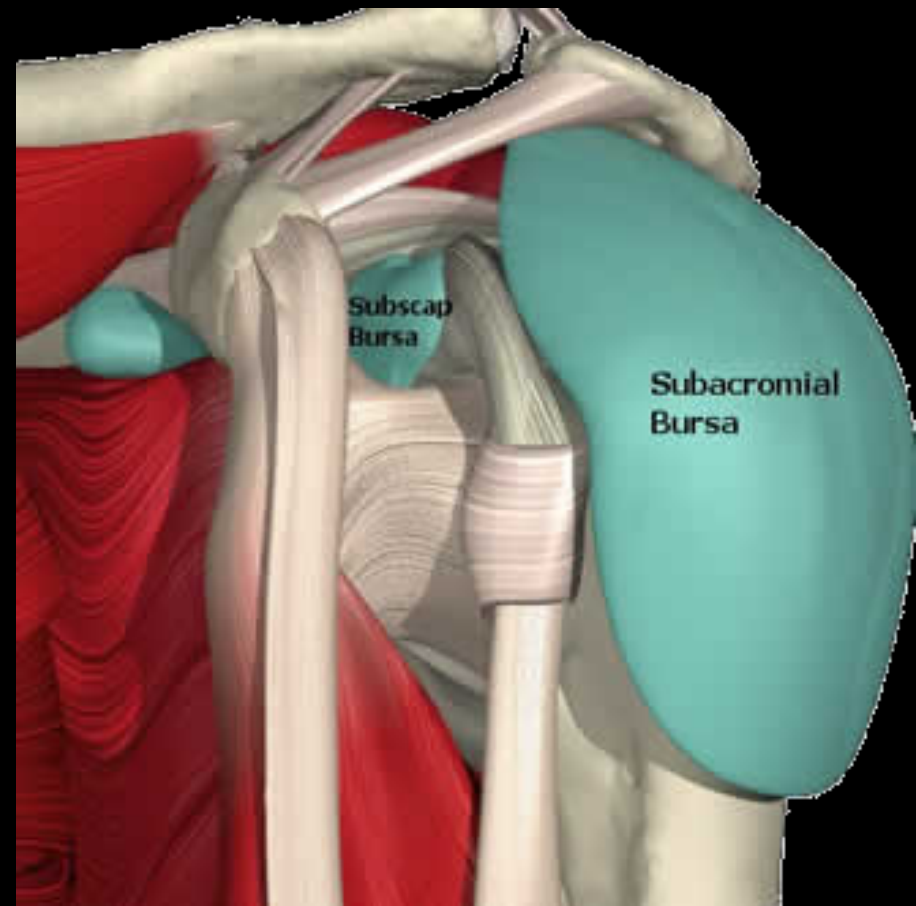


Anatomy of the Tendon of the Long Head of the Biceps

originates from the
labrum and the
supraglenoid tubercle

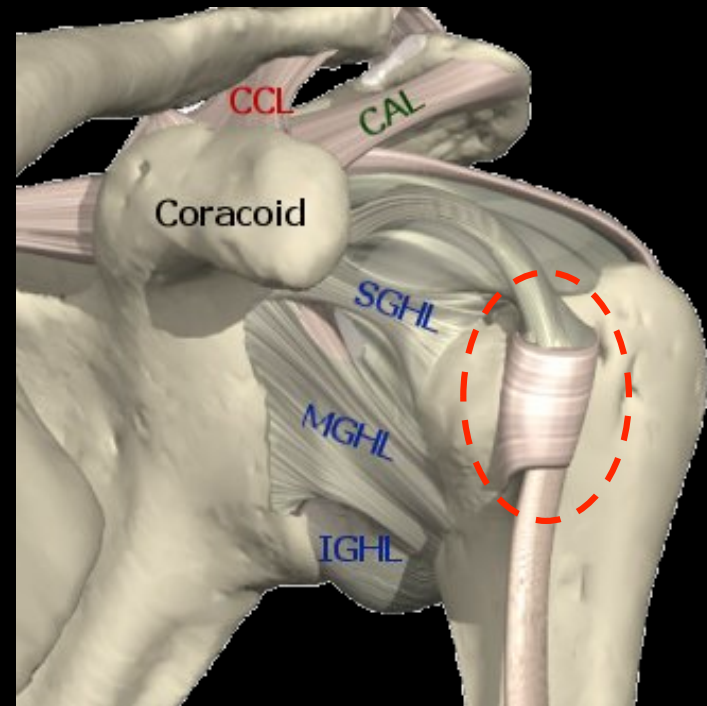


intraarticular and
extrasynovial structure

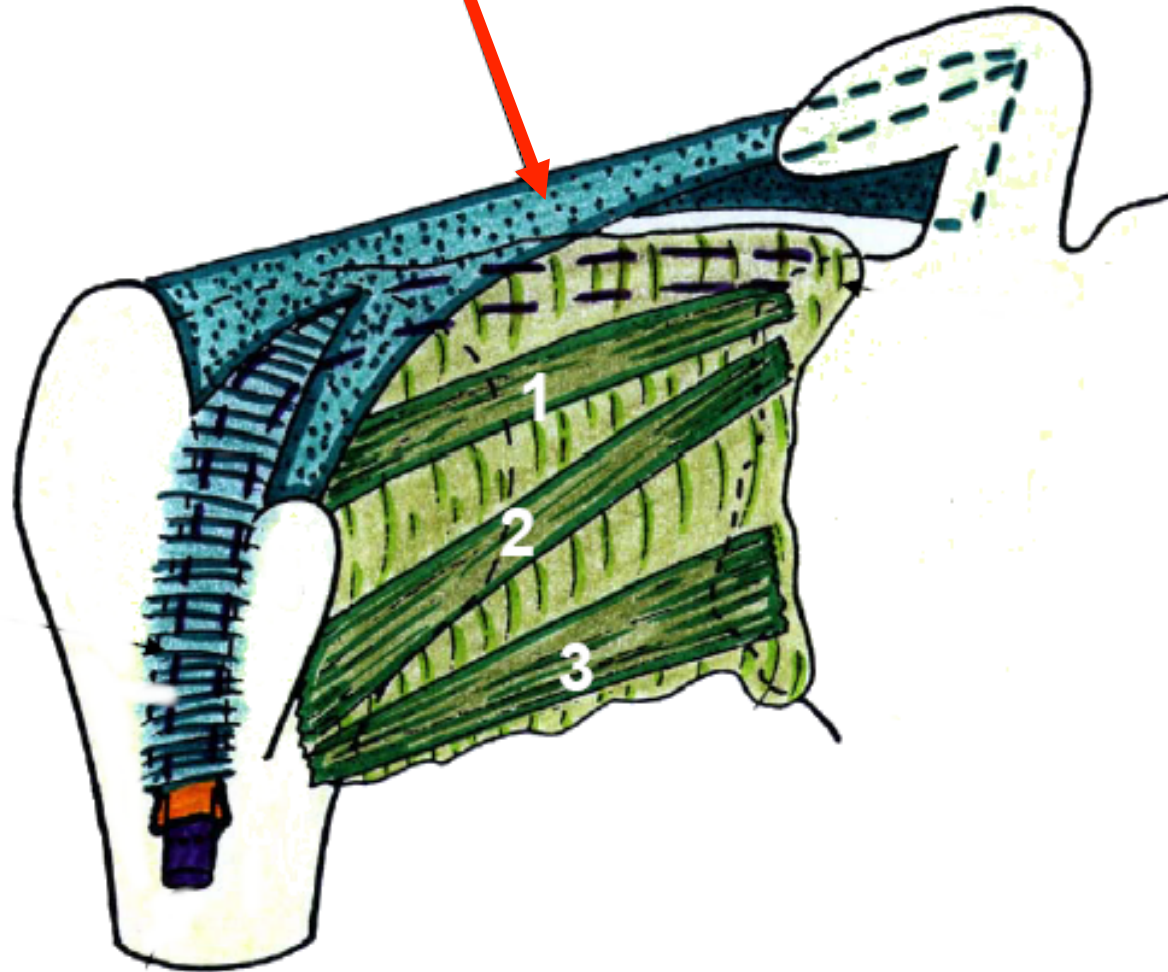


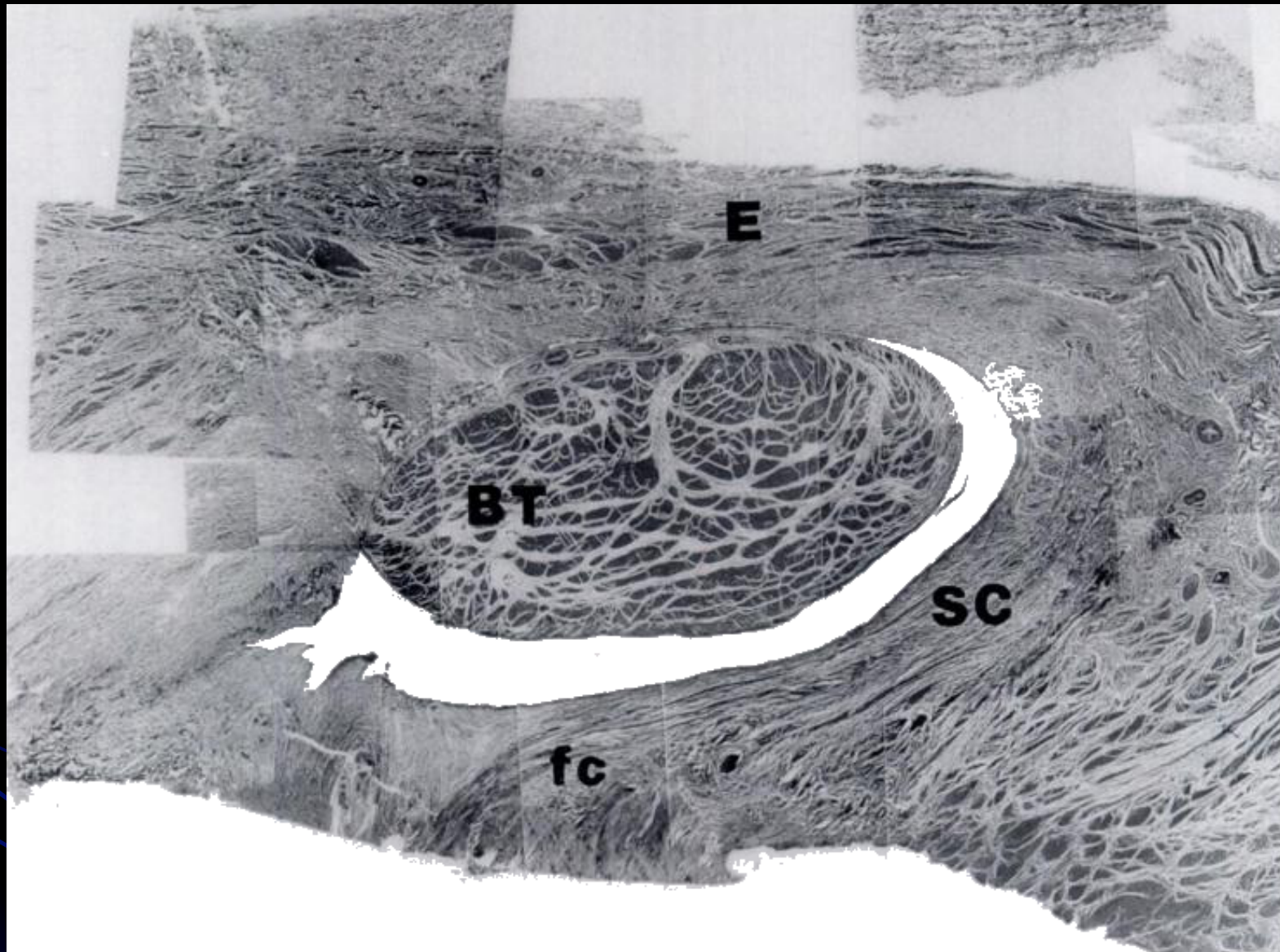
9 cm long and
5 mm to 6 mm wide

Stability is provided
by the transverse
humeral ligament



Coracohumeral ligament



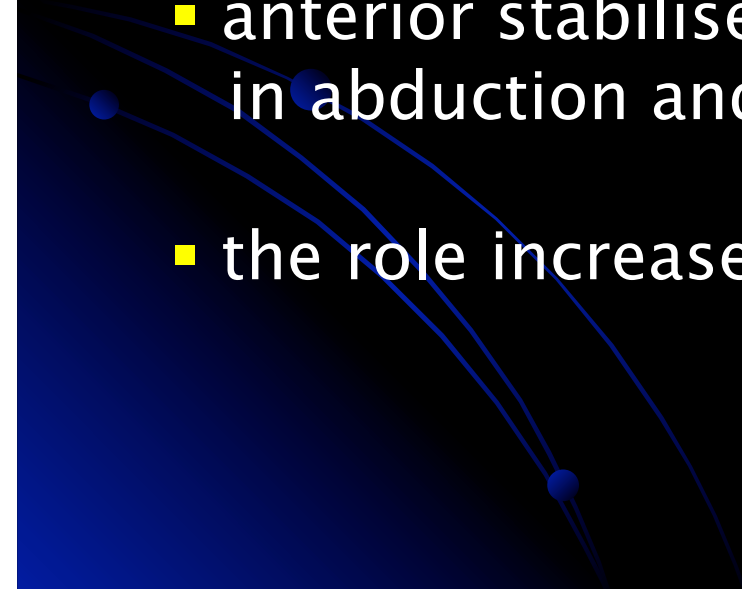


- The floor is formed primarily by a slip from the SSC
- The fibers crossing horizontally over the tendon are an extension from the SS tendon.

Arthroscopic Anatomy



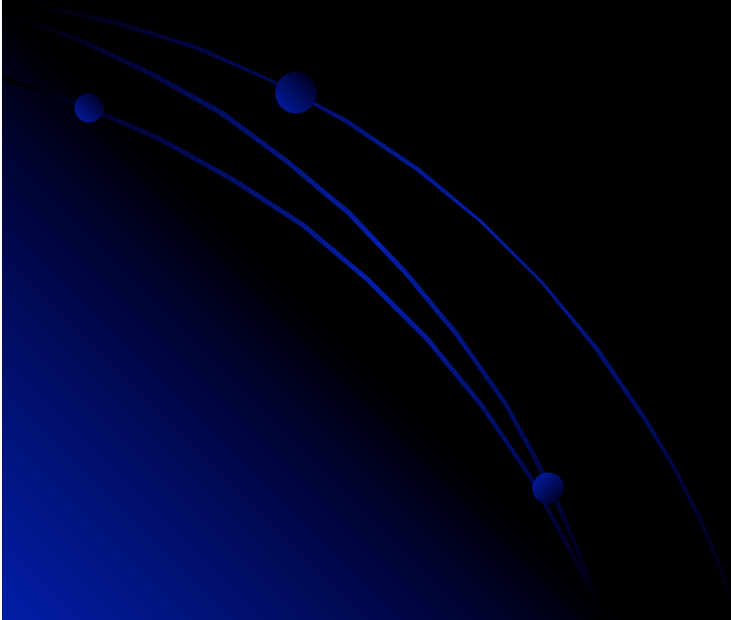
Functions of the Tendon of the Long Head of the Biceps

- depressor of the humeral head
 - weak abductor of the shoulder (7% to 10% of power)
 - anterior stabiliser of the GH joint with the arm in abduction and external rotation
 - the role increases as shoulder stability decreases
- 

- the proximal 1 / 3 of the biceps tendon has a high degree of innervation
- substance P and calcitonin gene-related peptides suggest a rich sympathetic network




Bicipital pathology is a significant cause
of morbidity around the shoulder.



Problems related to the biceps tendon

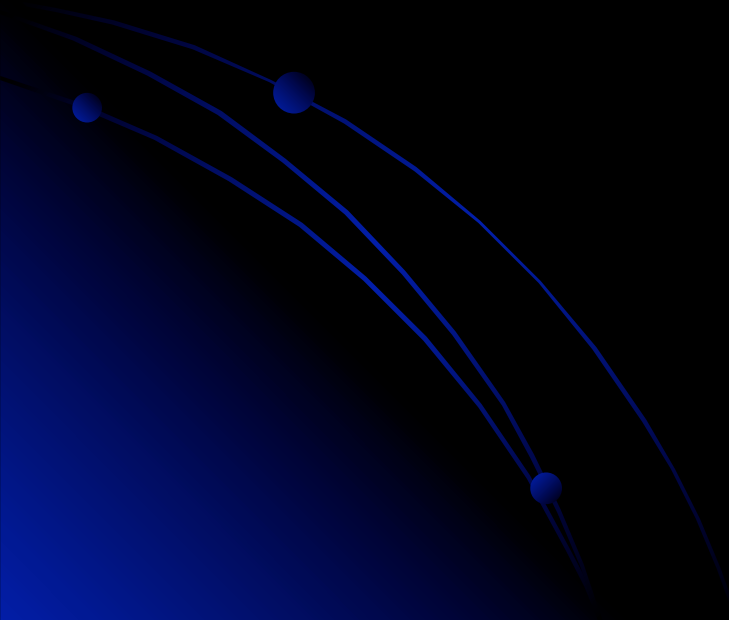
- Inflammatory
 - Tendinitis
 - Tenosynovitis

 - Instability
 - Subluxation
 - Dislocation

 - Traumatic
 - SLAP lesions
 - Partial or complete ruptures
- 

History and Physical Examination

- essential part of the clinical evaluation
- imaging studies are often non-diagnostic



History and Physical Examination

- **pain** localized to the region of the bicipital groove
- radiating pain that travels anteriorly toward the biceps muscle
- exacerbated by activities, particularly repetitive overhead sporting activities



Yergason's Test

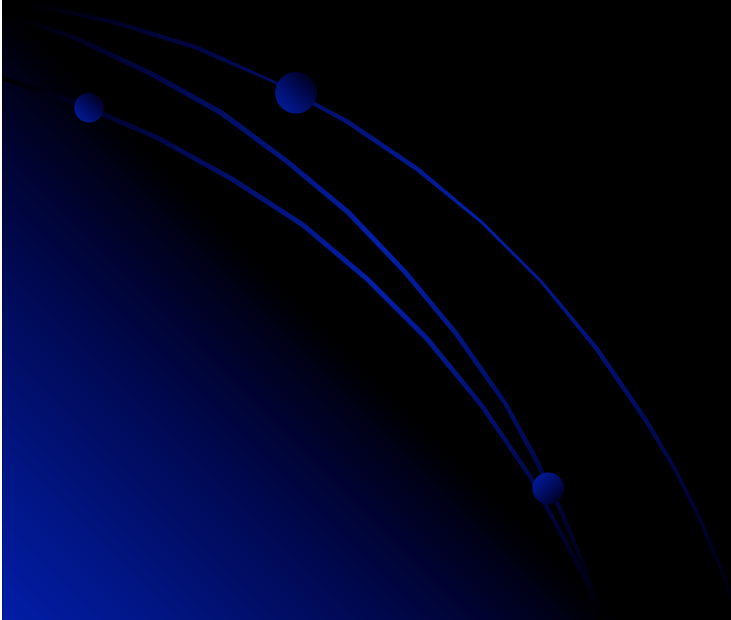


Speed's Test



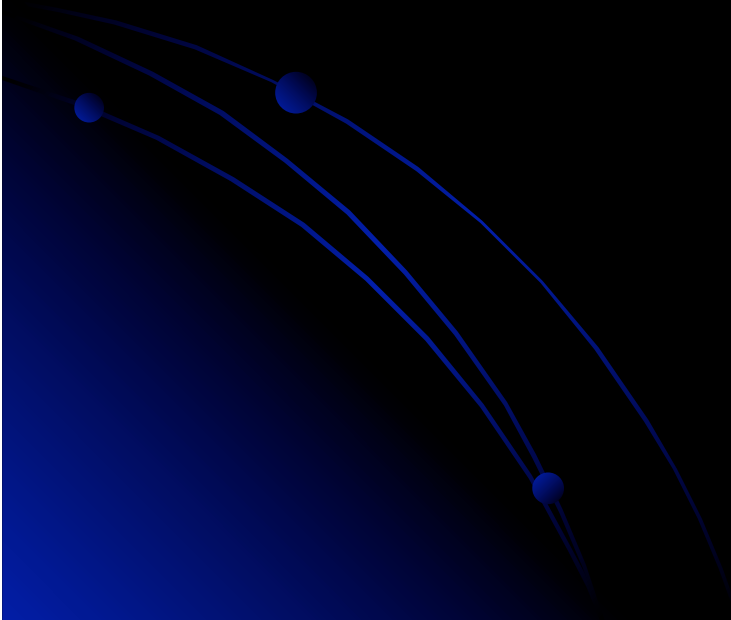
Specific tests assessing biceps pathology:

- These tests have poor specificity and are not pathognomonic
- Selective differential injections

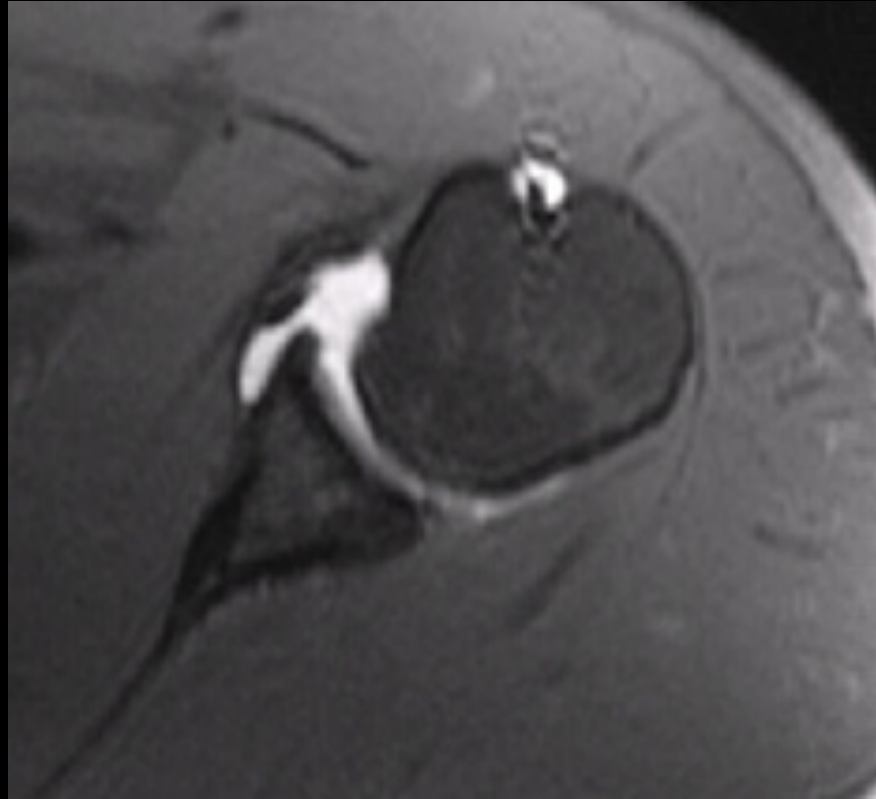


Imaging Studies

- Plain films are nondiagnostic
- Arthrography: hourglass biceps
- Ultrasound
- MRI

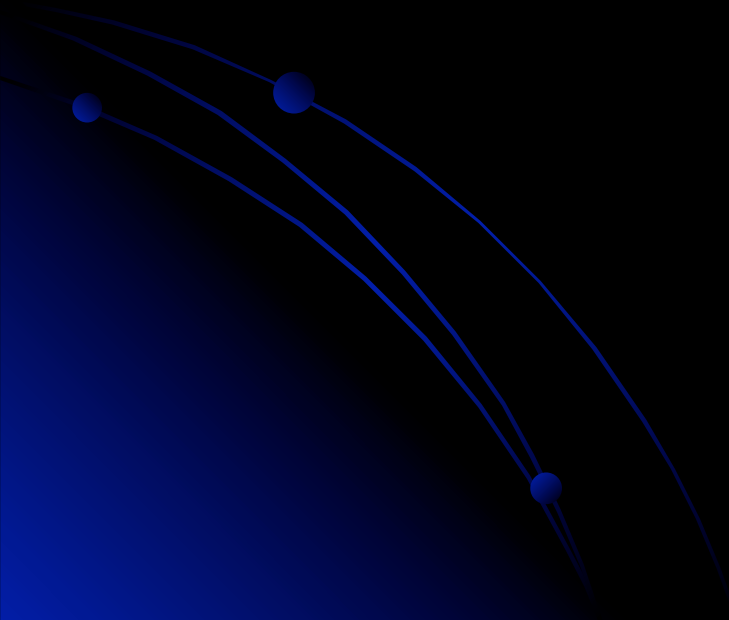


Imaging Studies

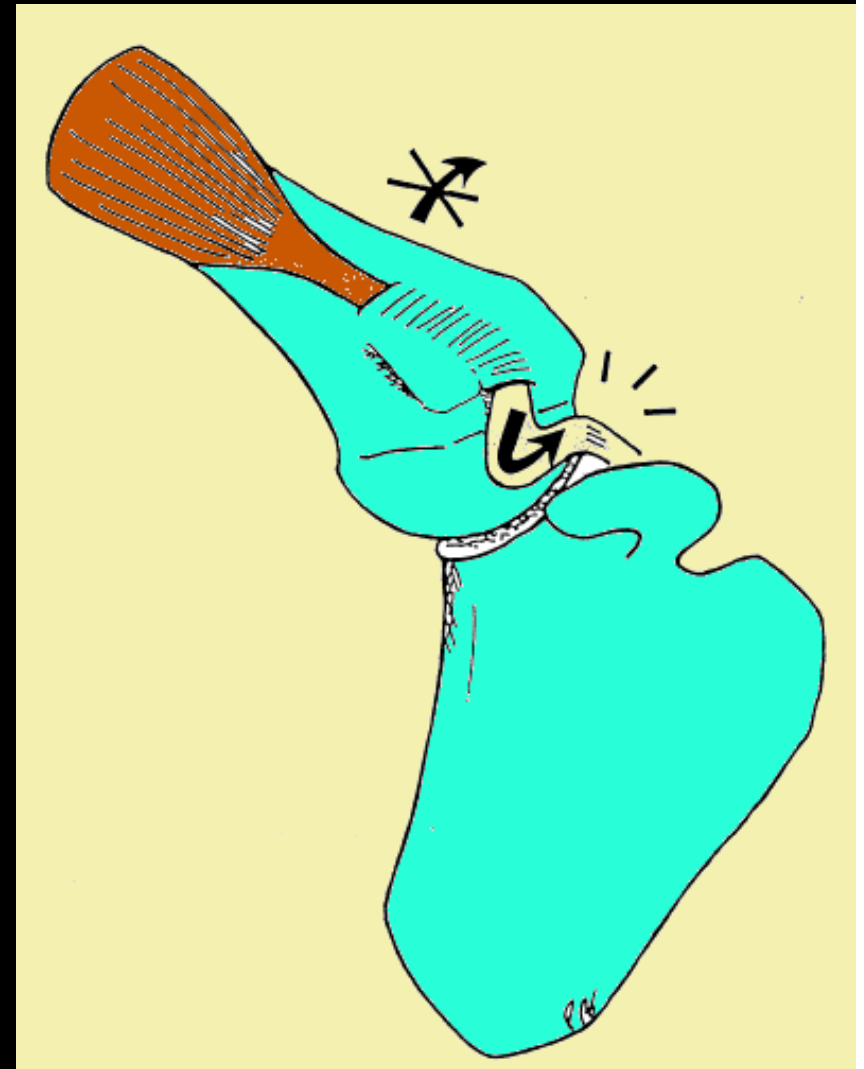
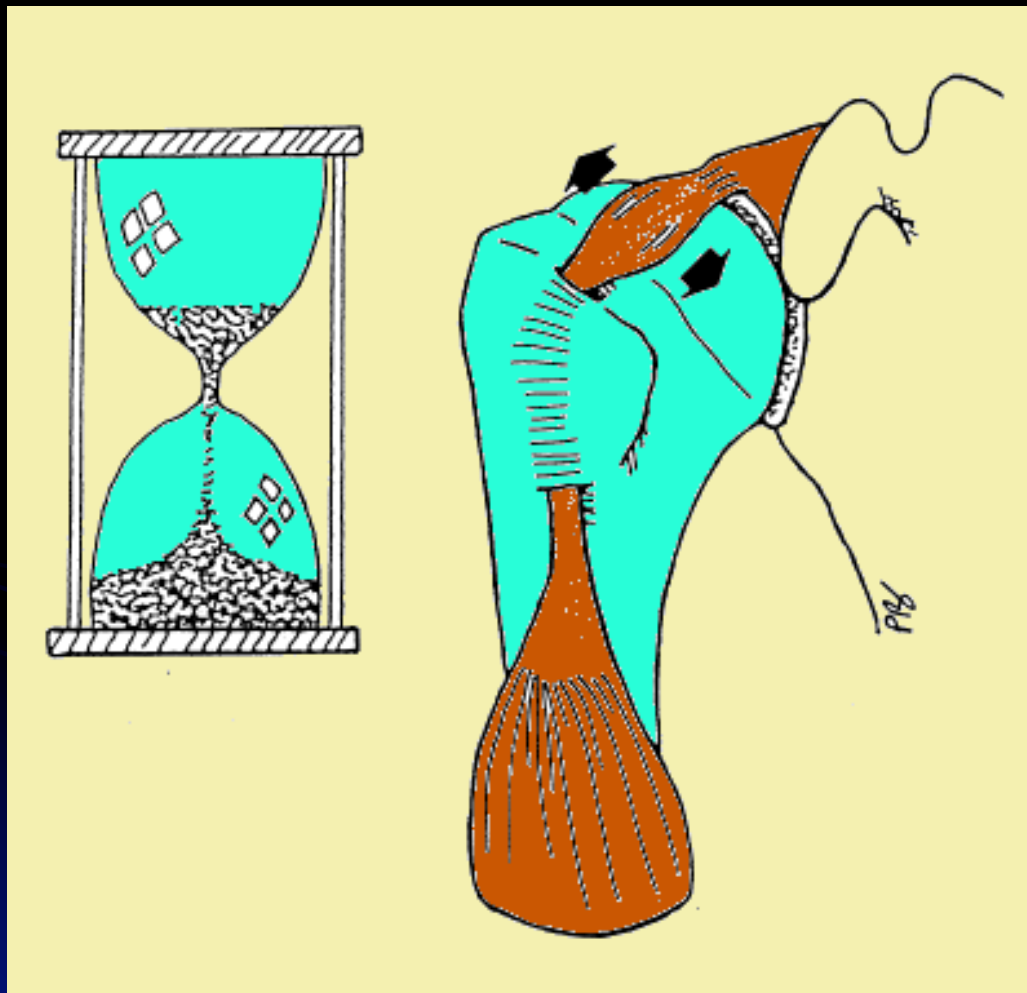


The contour of the biceps tendon is irregular and adhesions are present

arthrogram



The Hourglass Biceps

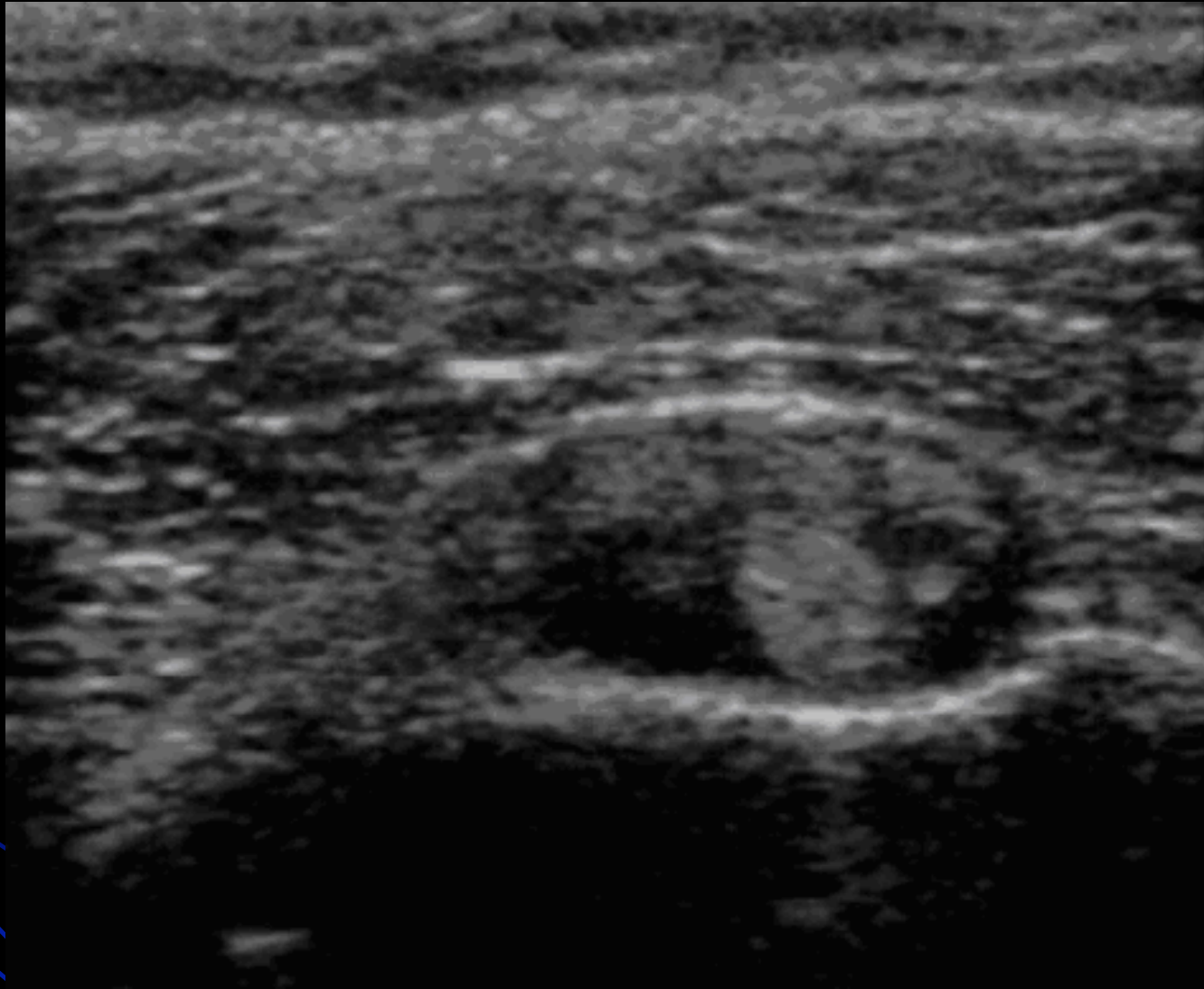




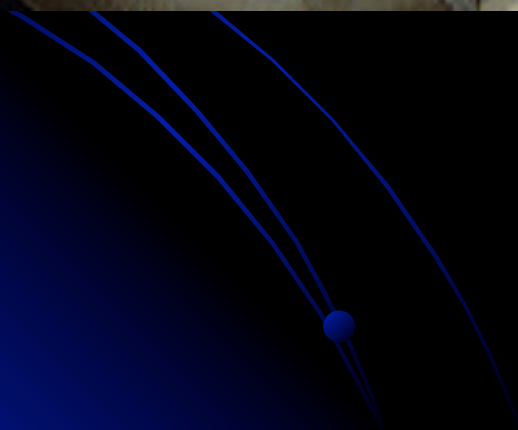
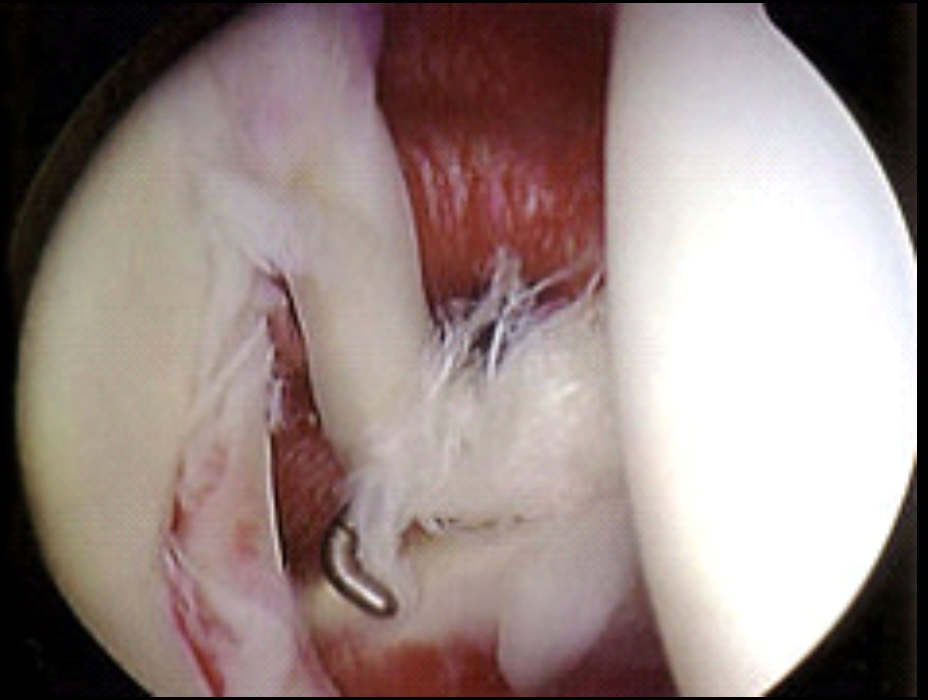
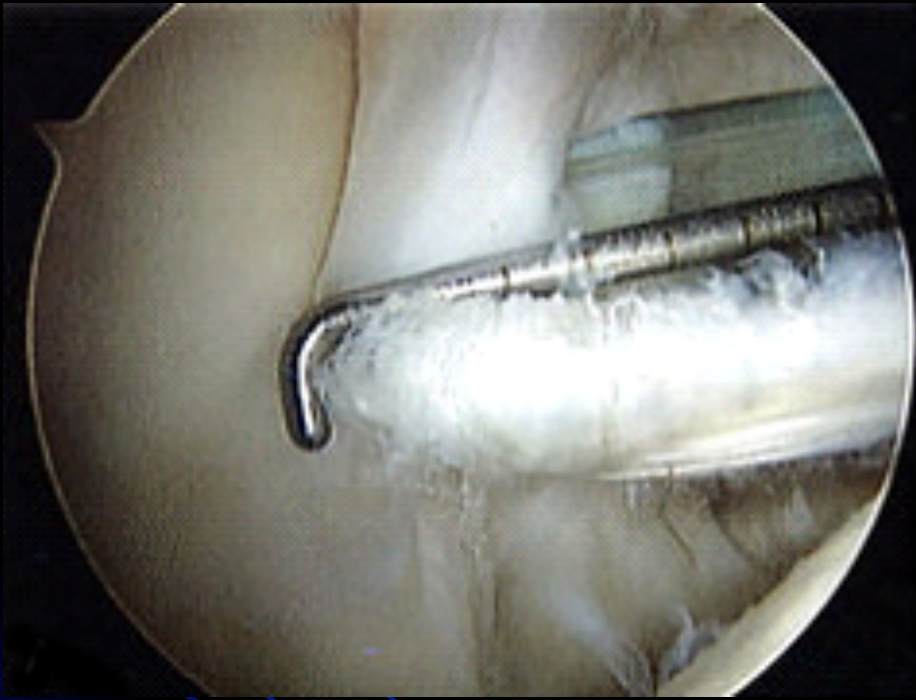
Partial tear of the LHB



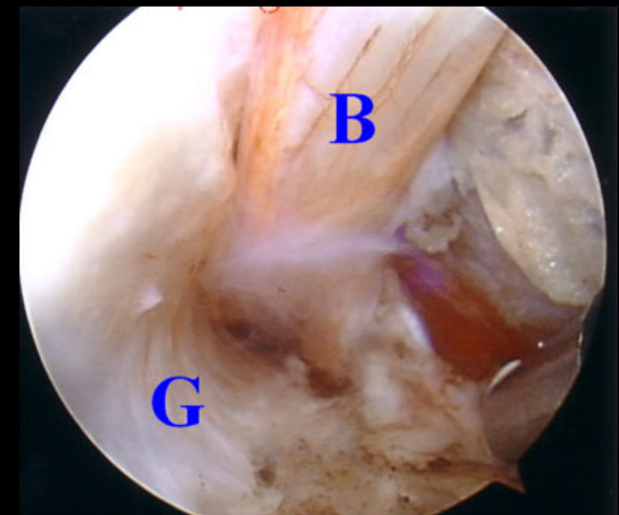
Medial dislocation



Peri-tendineous effusion and synovial proliferation of the long head of biceps tendon, with sheath distension.

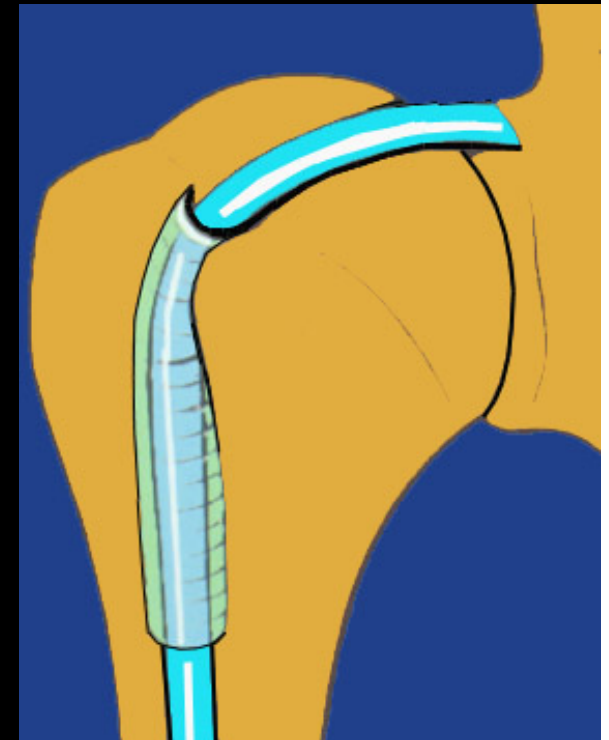


*Inflammation:
Tendonitis and Tenosynovitis*



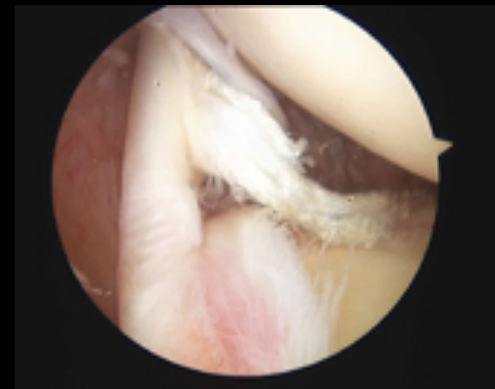
Primary biceps tendonitis

- rare (5%)
- caused by recurrent gliding of the humerus around the biceps tendon
- the tendon appears normal
- conservative treatment (rest, NSAIDs, corticosteroids)



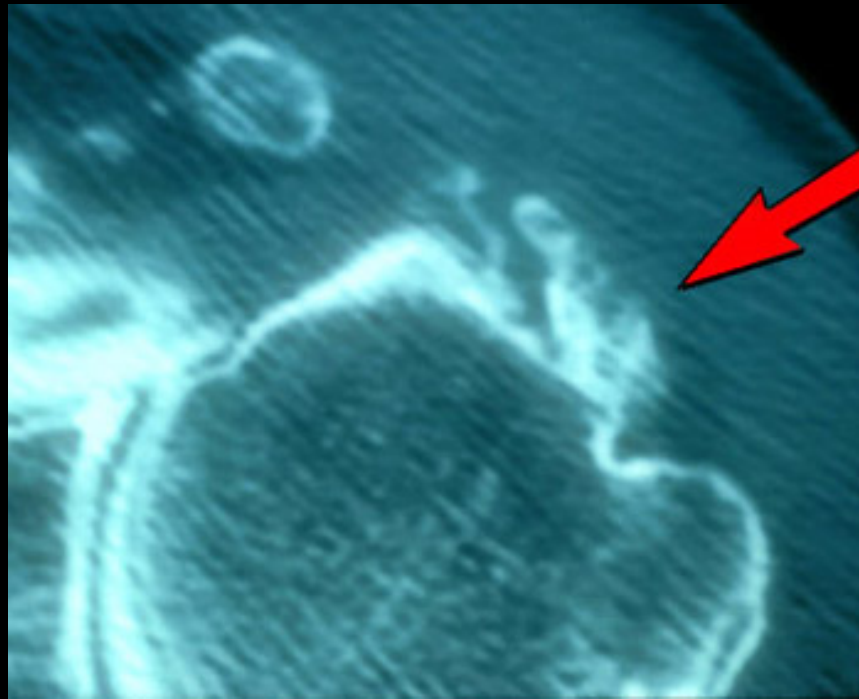
Secondary biceps tendonitis

- caused by underlying shoulder disease
- bicipital groove/rotator cuff/biceps instability
- closely associated with impingement



Pathology of the rotator cuff

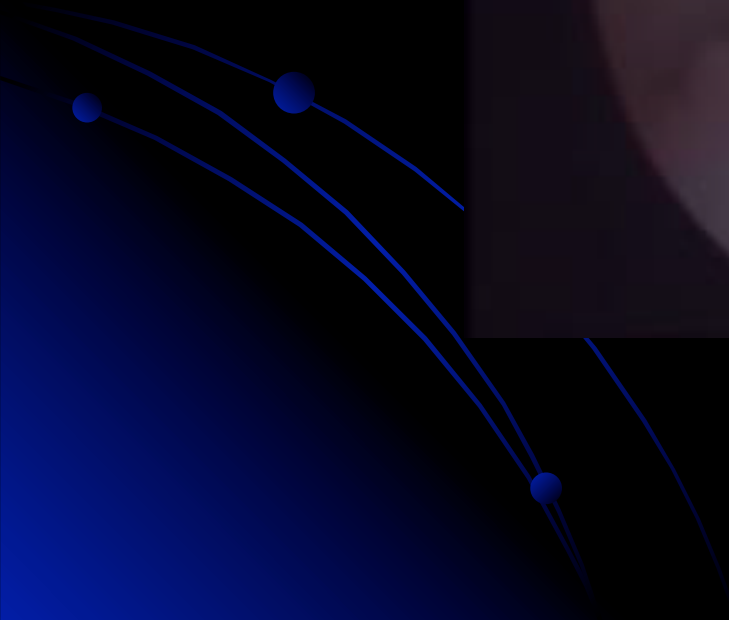
- the most common cause of biceps tendinitis
- classified by the type of underlying lesion
- superior 1 / 3 lesions of the SS can cause inflammation and distension of the ligamentous pulley and bicipital sheath, ultimately destabilizing the biceps within its groove



A medial osteophyte from prior trauma
to the lesser tuberosity

(courtesy of T. Bradley Edwards, MD)

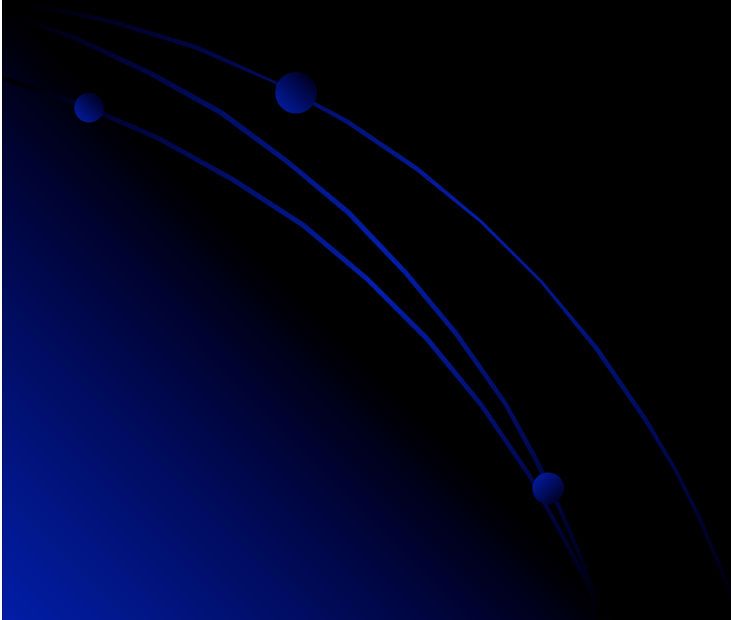
Biceps Fraying



Secondary biceps tendonitis

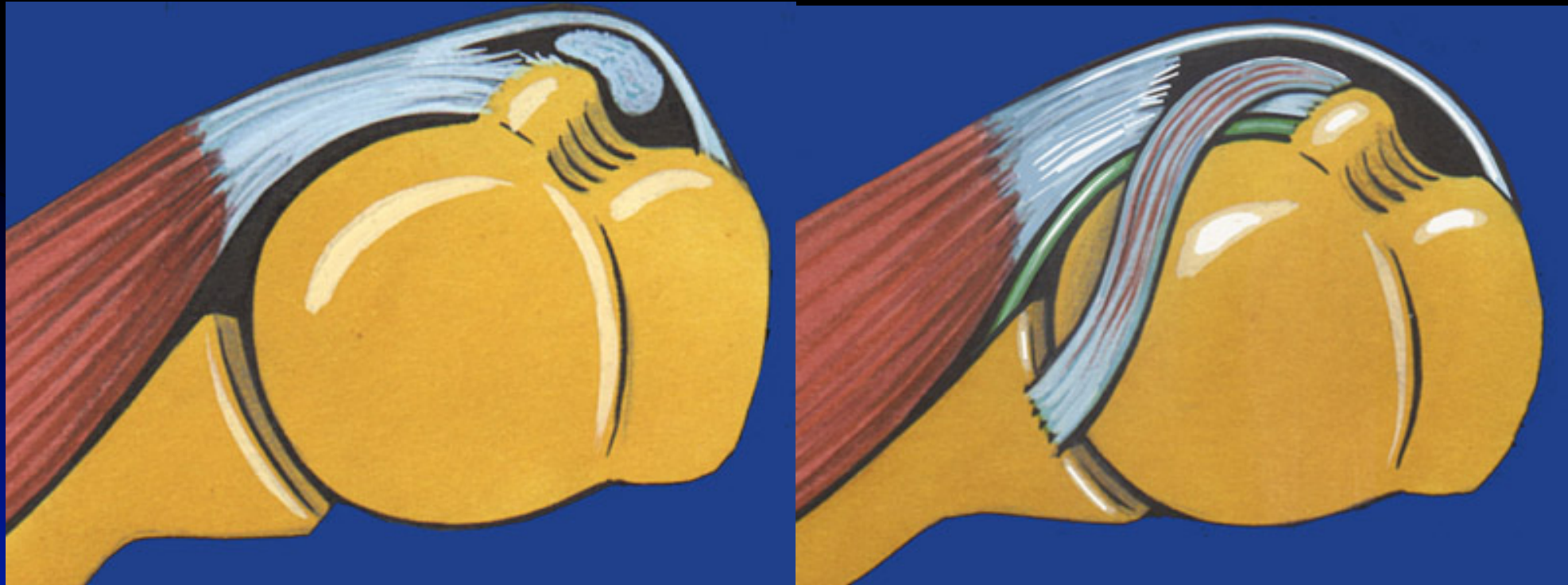
- Nonoperative treatment results in transitory relief unless the underlying diagnosis is addressed.
- Operative treatment includes addressing the underlying pathology and the biceps via tenotomy or tenodesis.

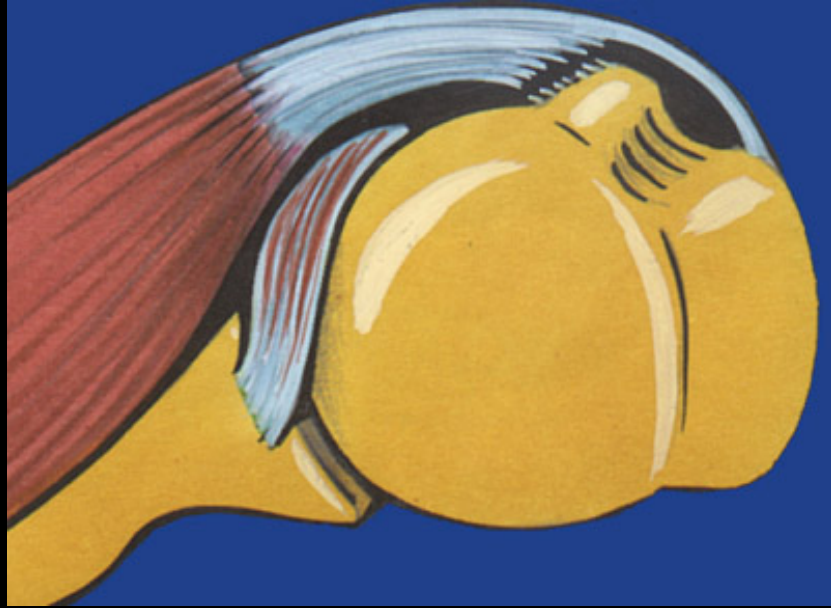
Instability: Subluxation & Dislocation



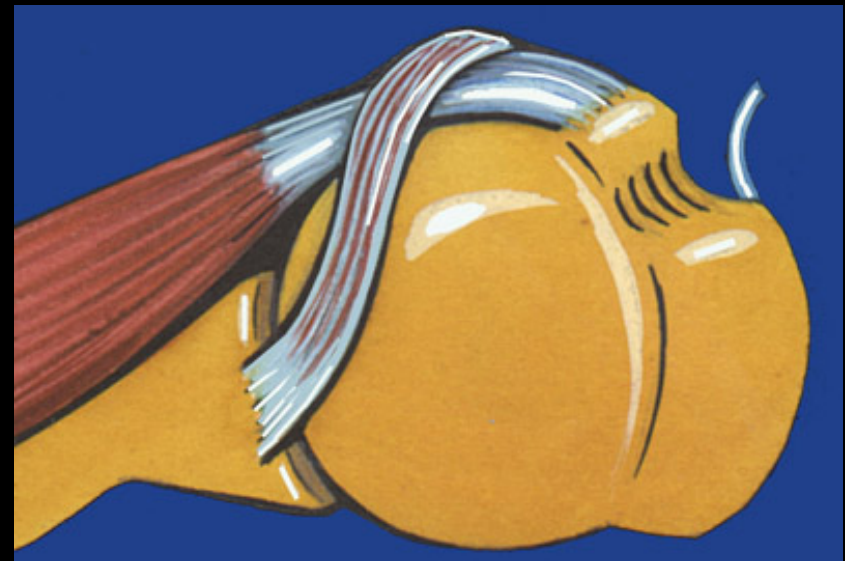
Instability of the biceps tendon

- may result in biceps tendonitis
- subluxation or dislocation



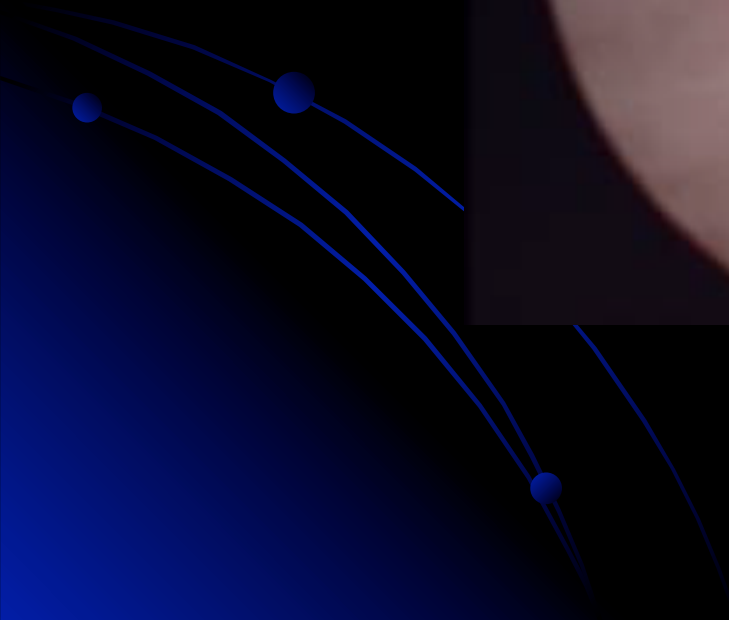
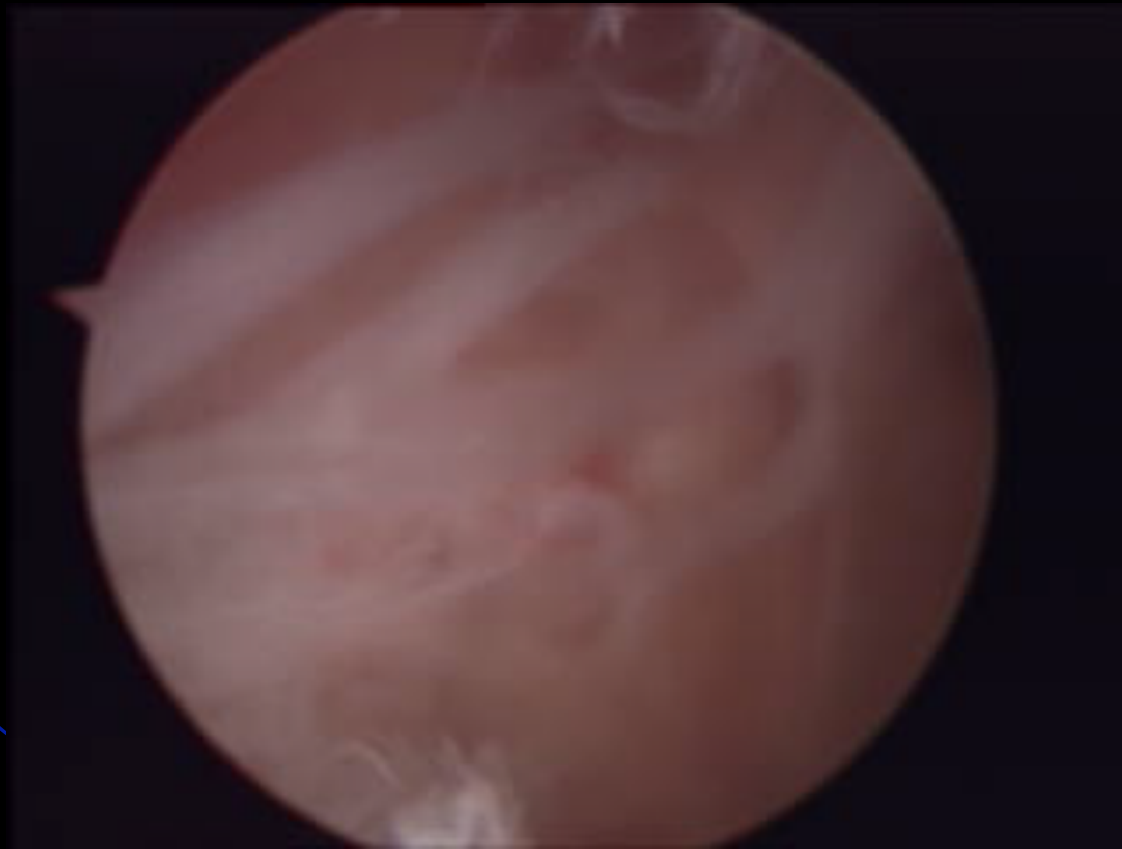


Intraarticular dislocation

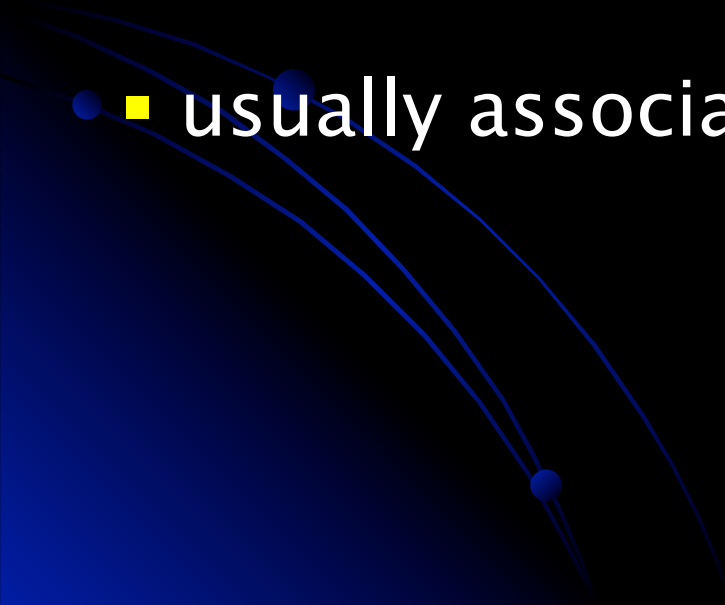


Extraarticular dislocation

Intraarticular Dislocation

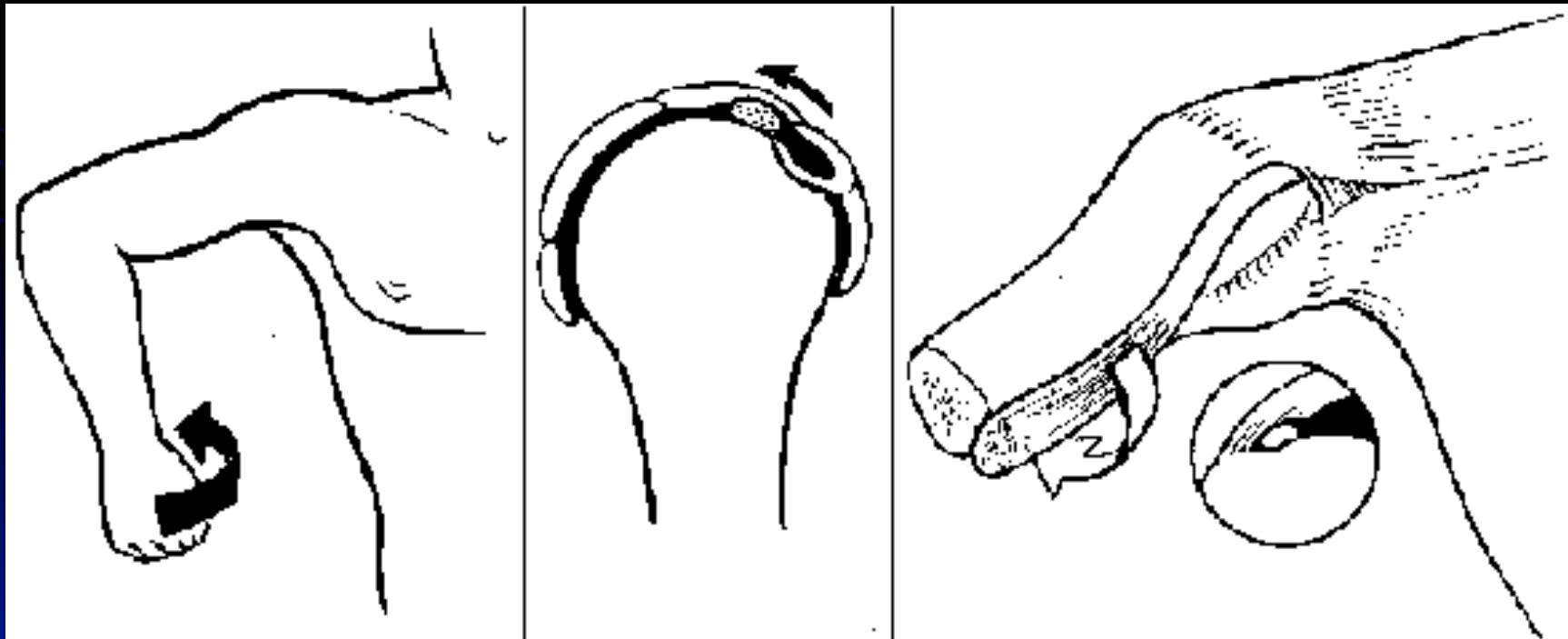


Biceps Subluxation

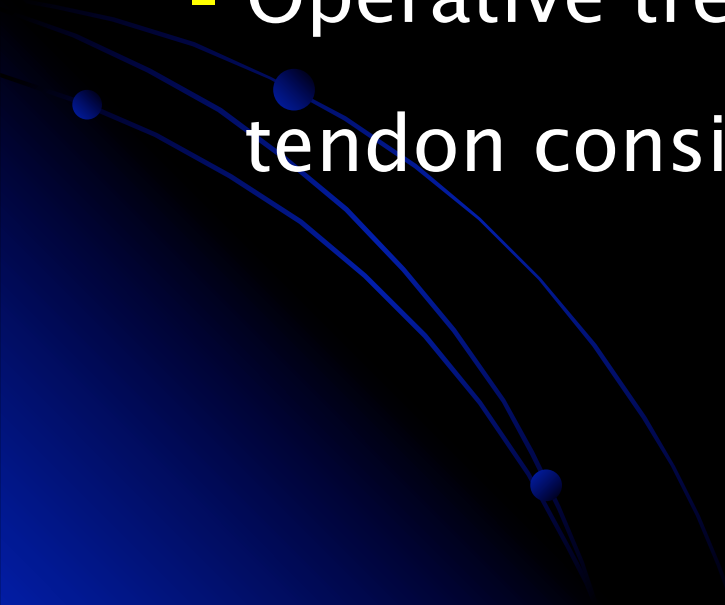
- occurs in a medial direction via disruption of the ligamentous pulley resulting in fraying of the **medial aspect** of the LHB
 - exception is the throwing athlete
 - usually associated with SSC ruptures
- 

*Articular-sided, partial thickness tears of the SS
(internal impingement)*

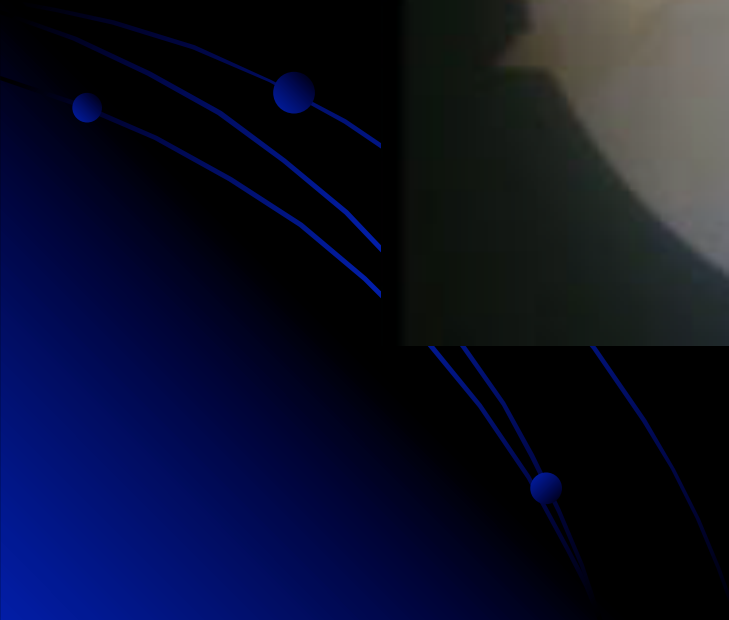
Mechanical abrasion of the **lateral aspect** of the LHB as it "rides up" onto the greater tuberosity during the follow-through phase of throwing



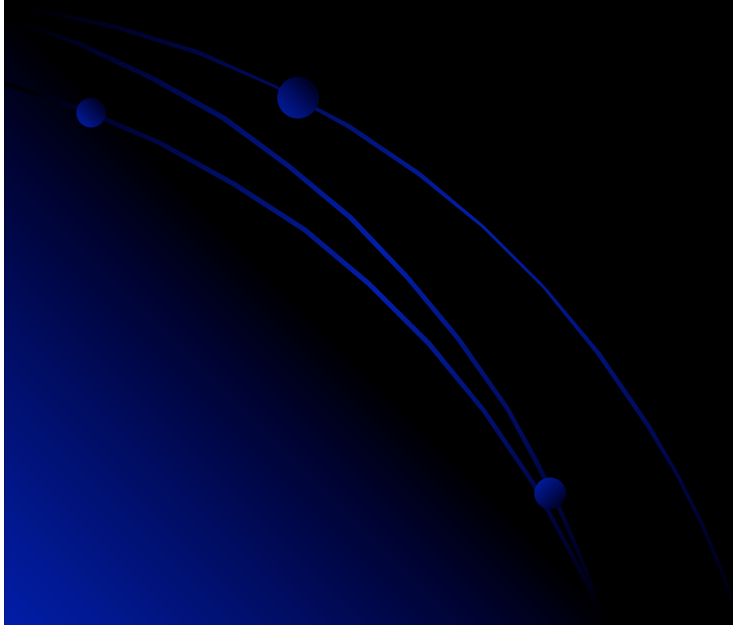
Treatment of biceps instability

- Nonoperative treatment through avoidance of repetitive elevation
 - Operative treatment for the unstable biceps tendon consists of tenotomy or tenodesis
- 

Tenotomy



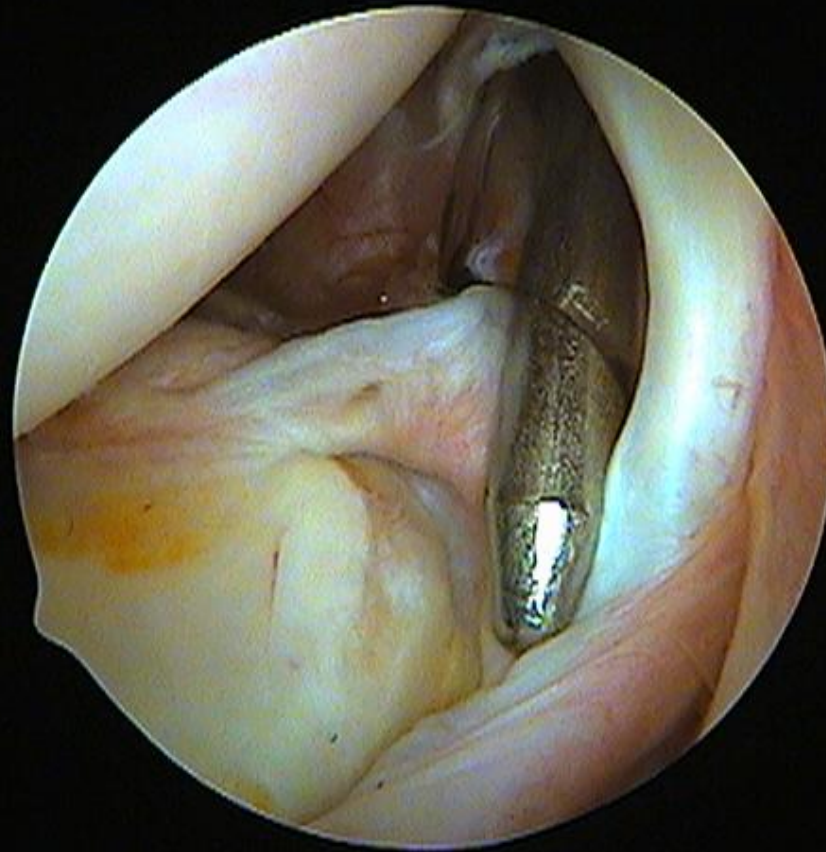
Trauma



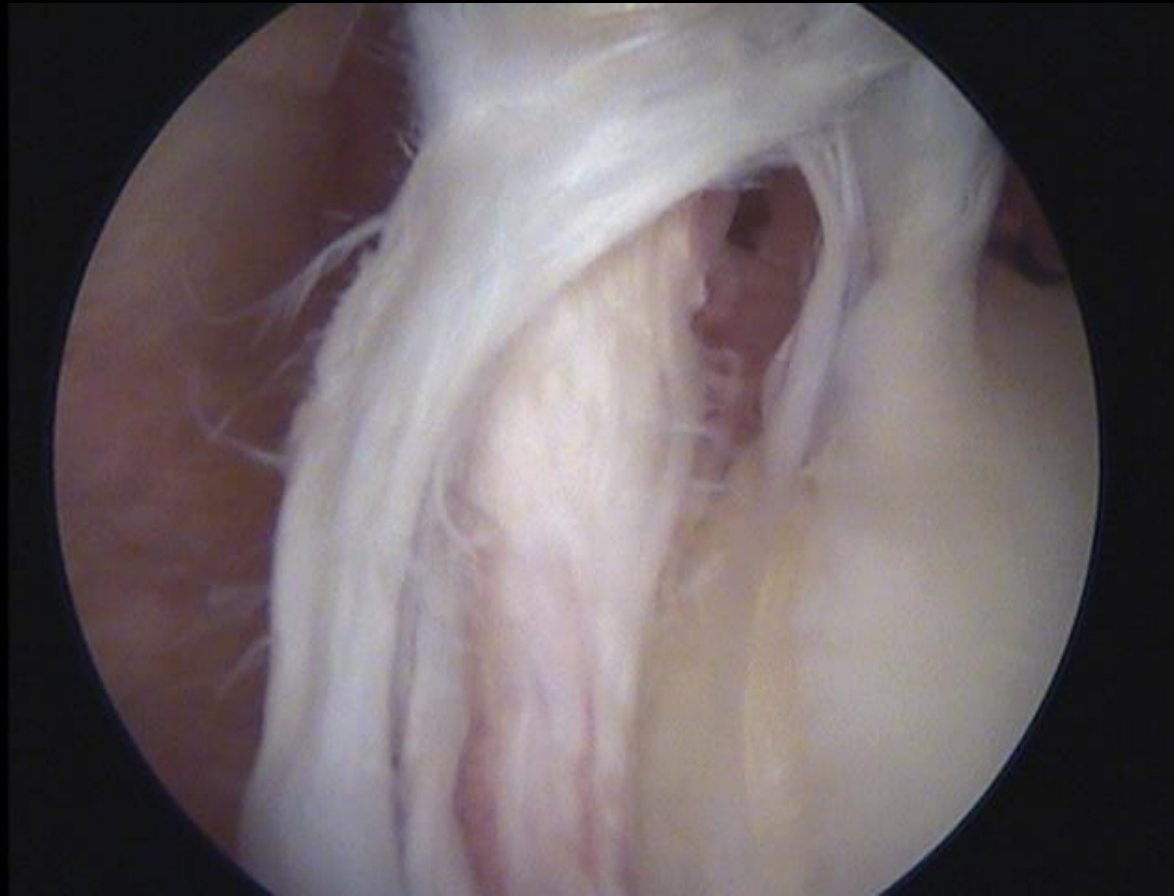
Trauma: Popeye Muscle



SLAP Lesions



SLAP IV lesion:



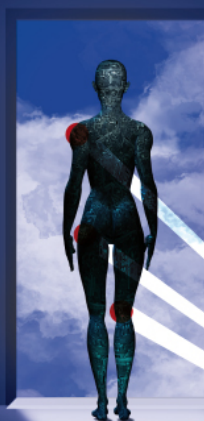
*"the role of the Physician
is to entertain the patient
whilst his disease runs
its usual course."*



Molière
17th century

3^ο Πανελλήνιο Συνέδριο

Ελληνικής Εταιρείας
Αρθροσκόπησης,
Χειρουργικής Γόνατος &
Αθλητικών Κακώσεων



24-27
Ιουνίου
2009

Ξενοδοχείο
Creta Maris
Κρήτη

Διοργάνωση



Ελληνική Εταιρεία Αρθροσκόπησης,
Χειρουργικής Γόνατος & Αθλητικών Κακώσεων
Ιωάνος Δραγούμη 54, 11528, Αθήνα.
Τηλ.: 210 7230069 (Κάθε Πέμπτη 17:00-22:00)
Email: info@eae-net.gr, Web site: www.eae-net.gr

Οργάνωση - Γραμματεία Συνεδρίου

Εκθέση - Χορηγίες - Τουριστικές Υπηρεσίες

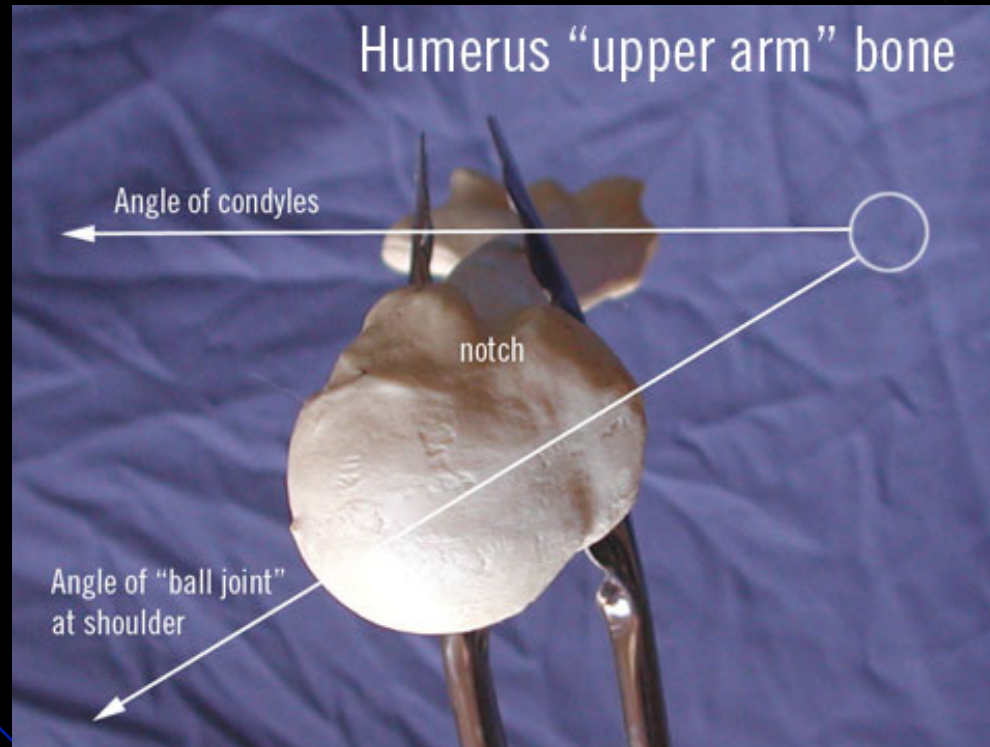


PCO-CONVIN S.A.

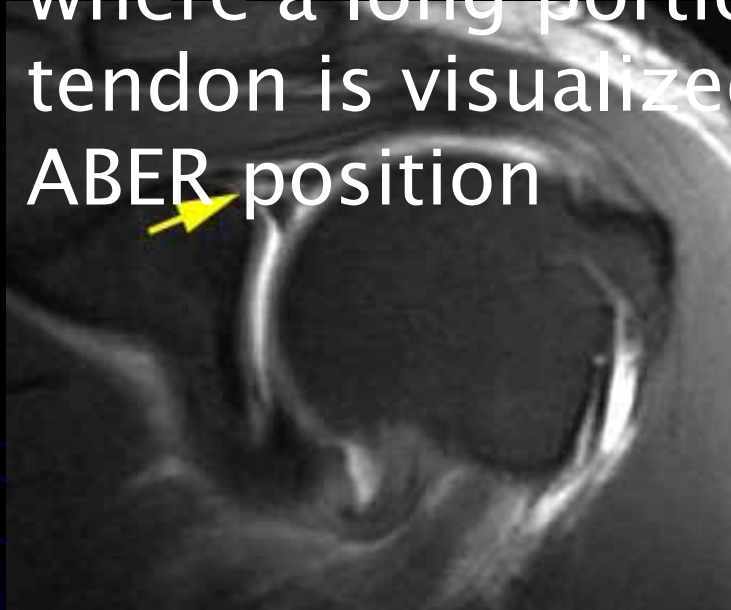
Κώστα Βάρναλη 29, 152 33 Χαλάνδρι, Αττική.
Τηλ. Κέντρο: 210 6833600, Fax: 210 6847700, E-mail: congress@pco-convin.gr, Web Site: www.pco-convin.gr



Humerus "upper arm" bone



32 year old baseball pitcher with a superior labral tear (SLAP tear), seen in the coronal plane and in the same case, where a long portion of the biceps tendon is visualized to its anchor in the ABER position



Shoulder pain

Intrinsic

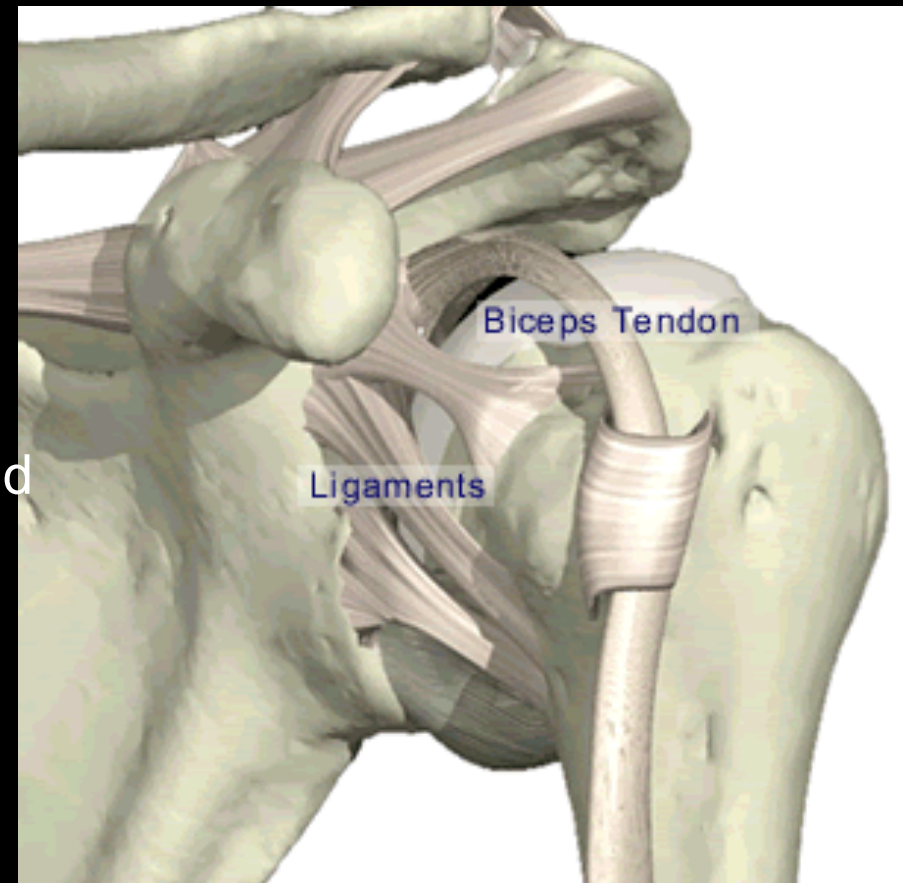
Rotator cuff disorders
Glenohumeral disorders
Acromio-Clavicular jt

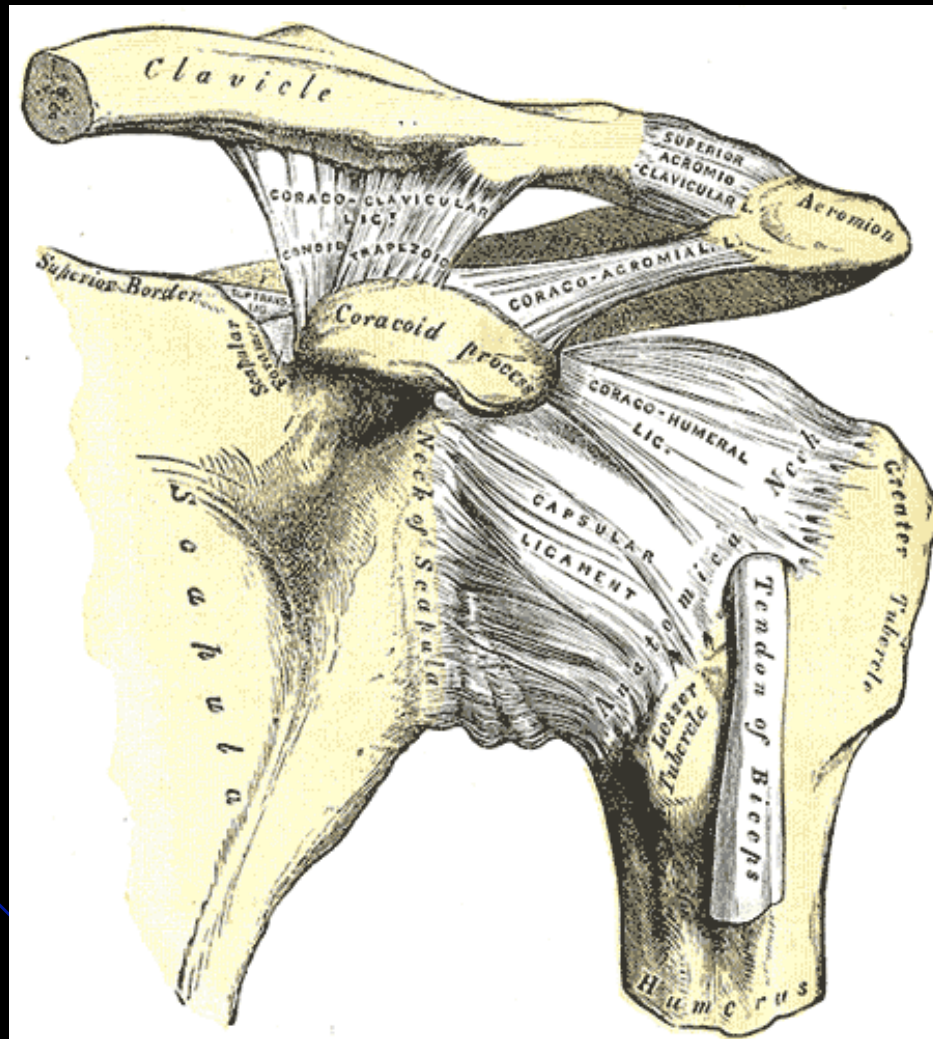
Extrinsic

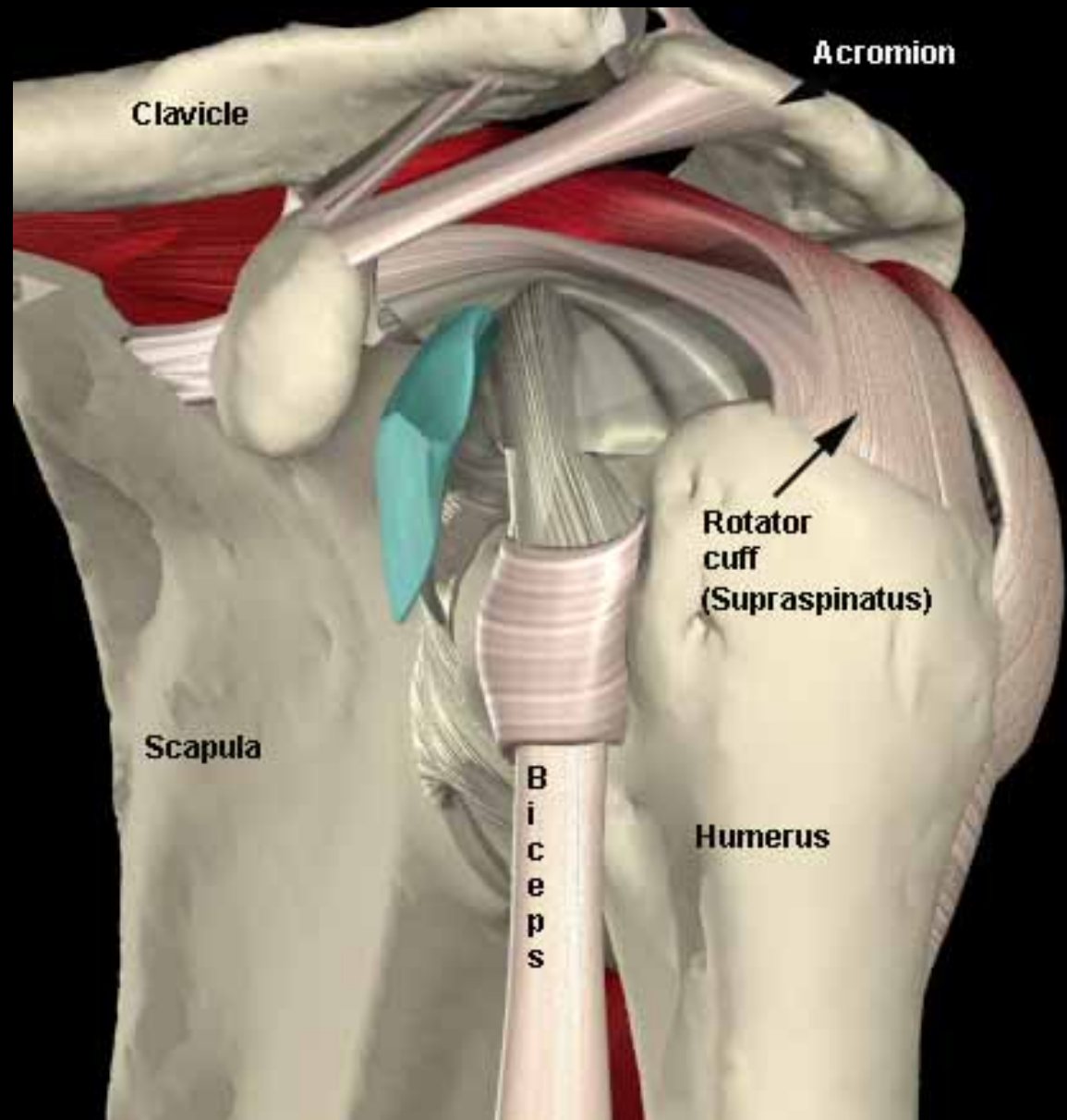
Referred neck pain
Cervical spondylosis
Cancer (Lung, spine, mets)
Subphrenic abscess
Biliary colic or disease
Ectopic pregnancy

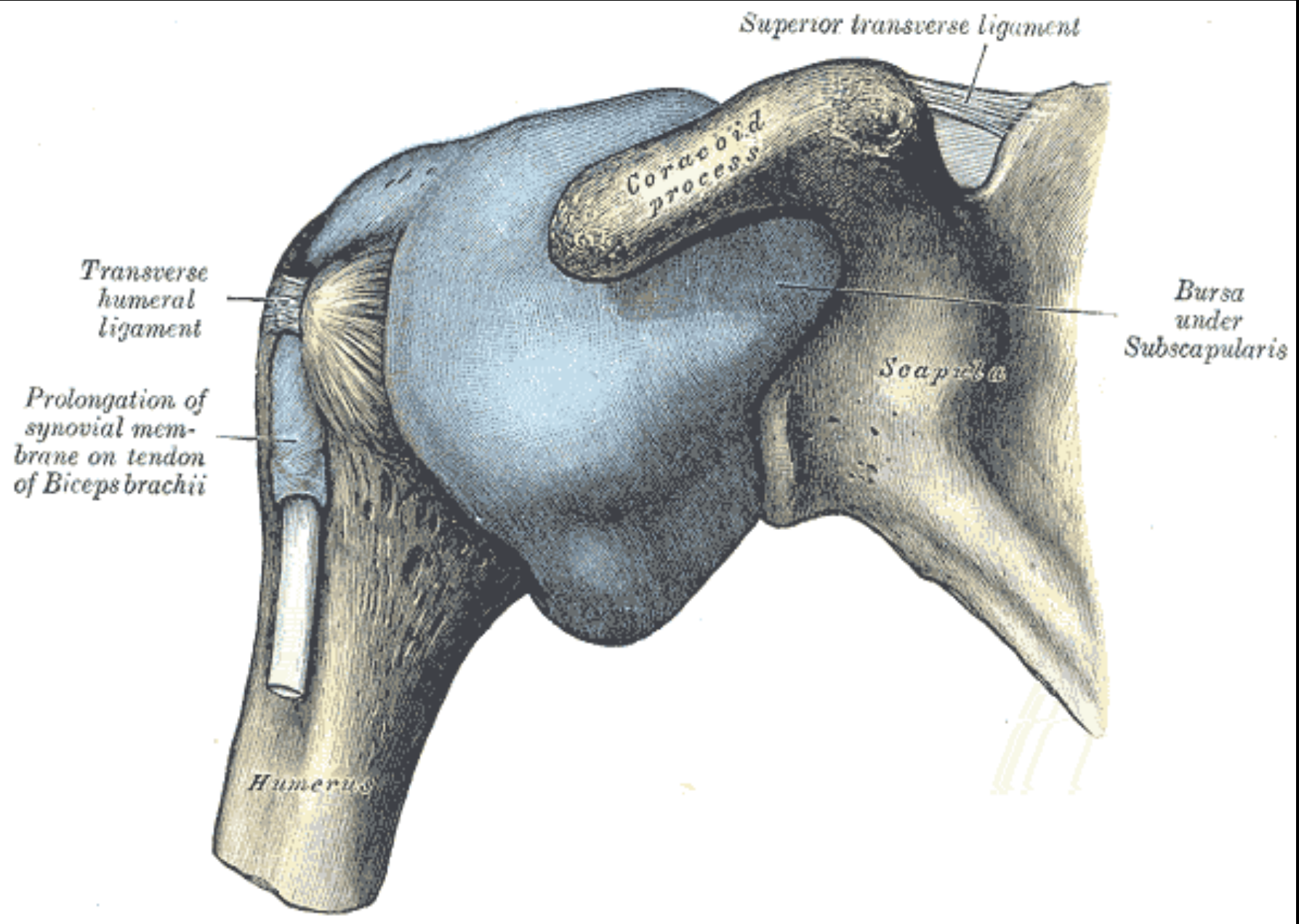
Gross Anatomy of the Long of Head of Biceps

- Flexion
- Abduction
 - Long head attaches on the supraglenoid tuberosity of the scapula
 - Short head attaches on the coracoid process of scapula
 - Stability is provided by the transverse humeral ligament

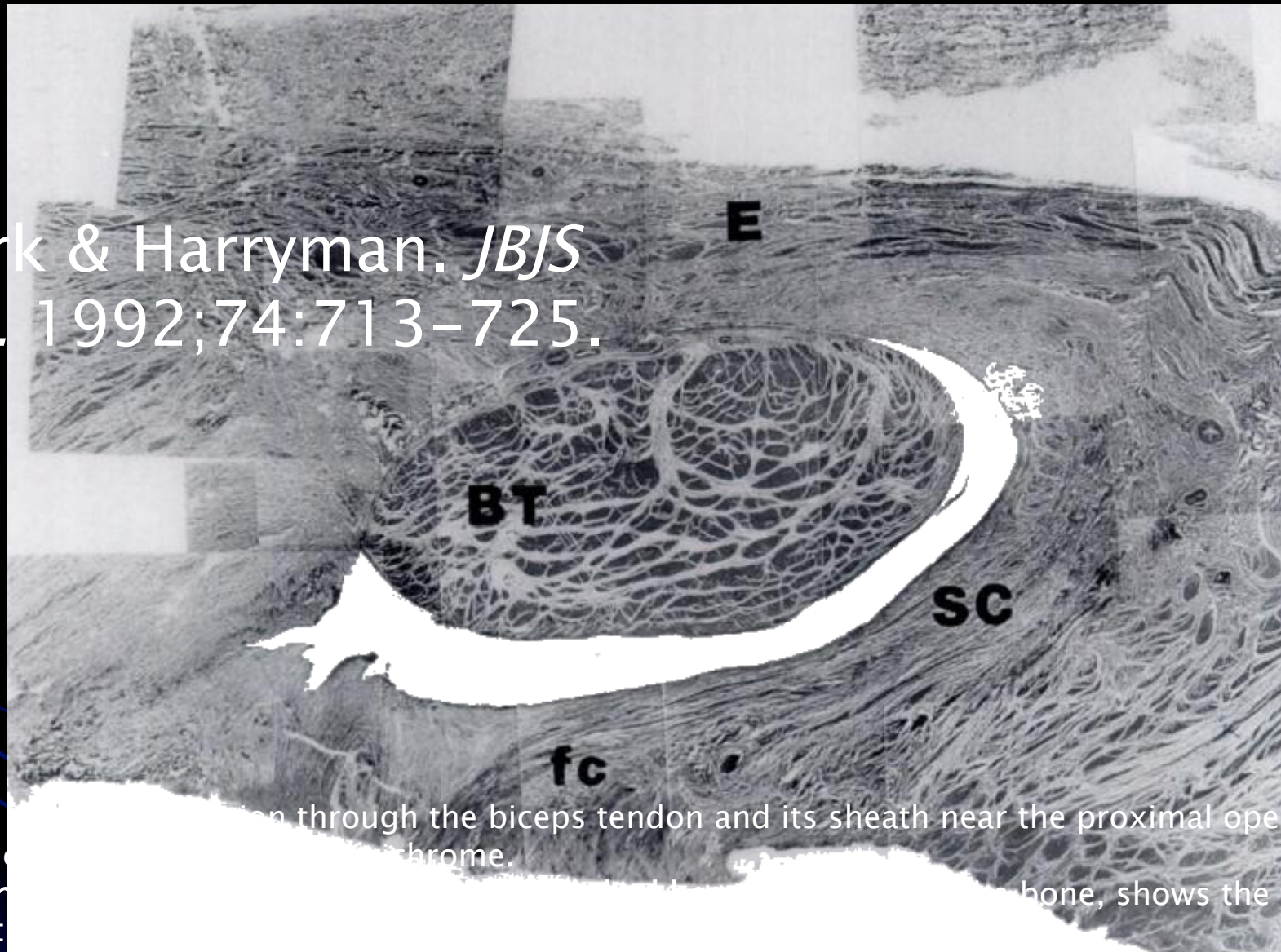






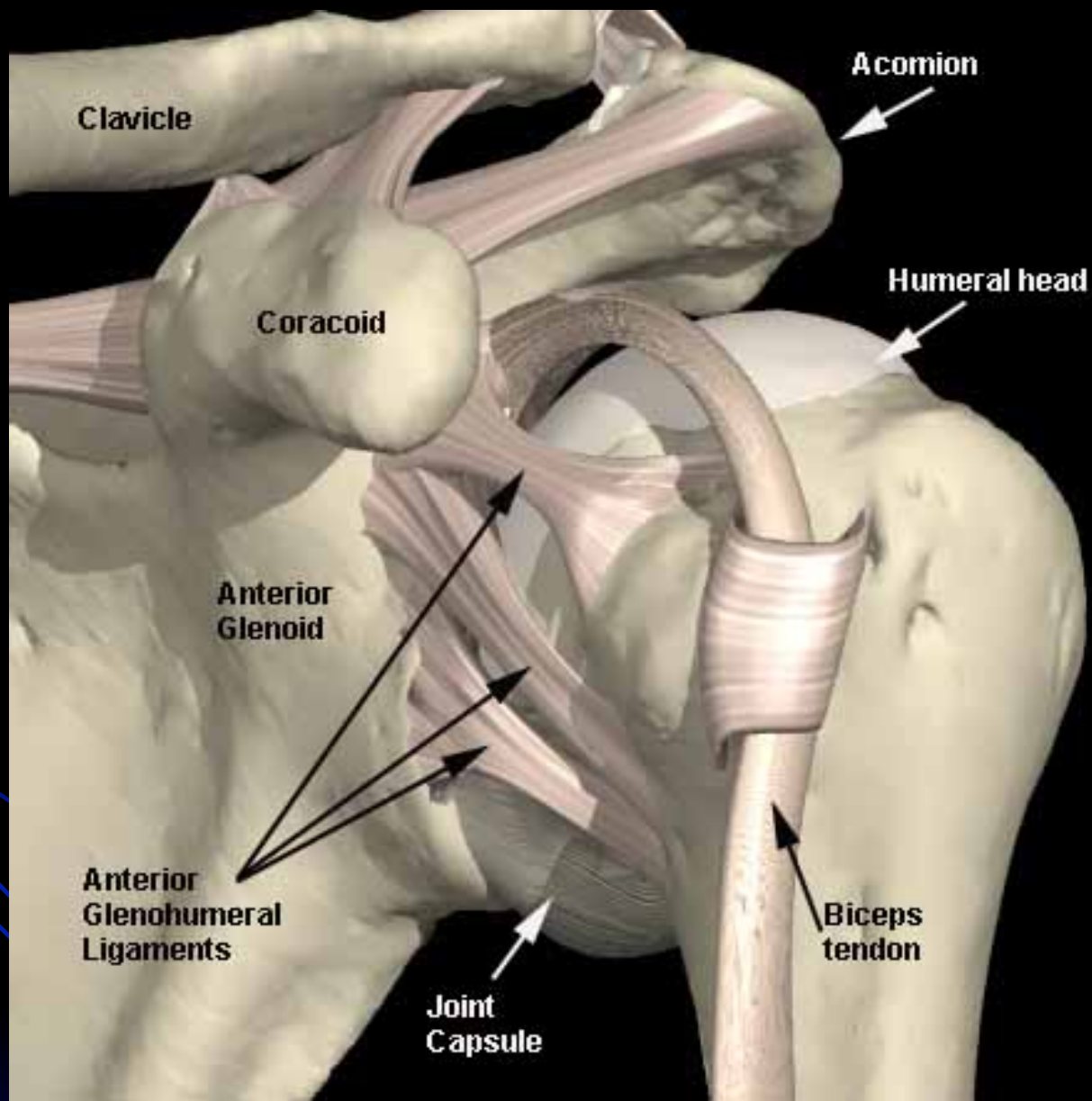


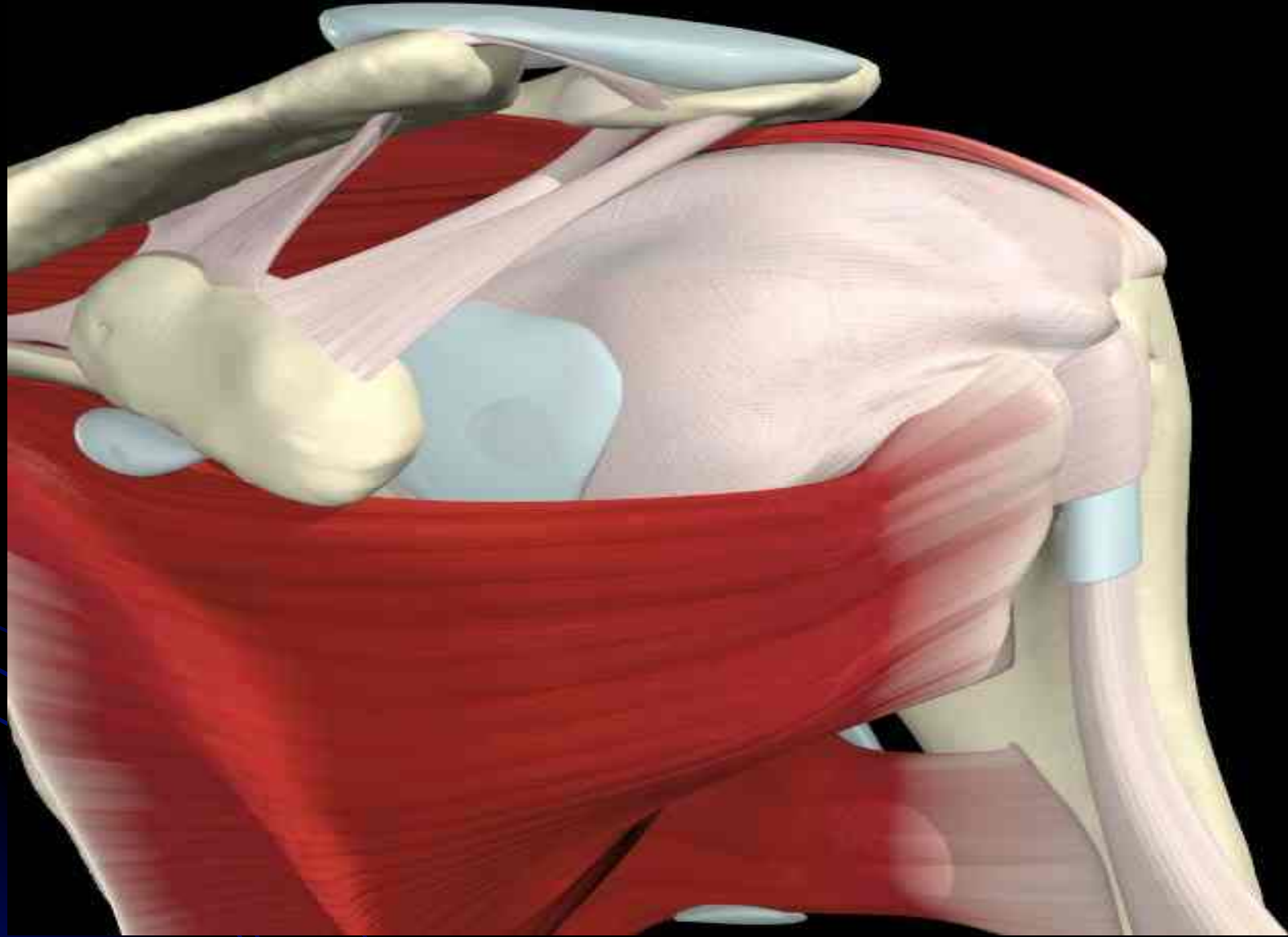
Clark & Harryman. *JBJS Am.* 1992;74:713-725.

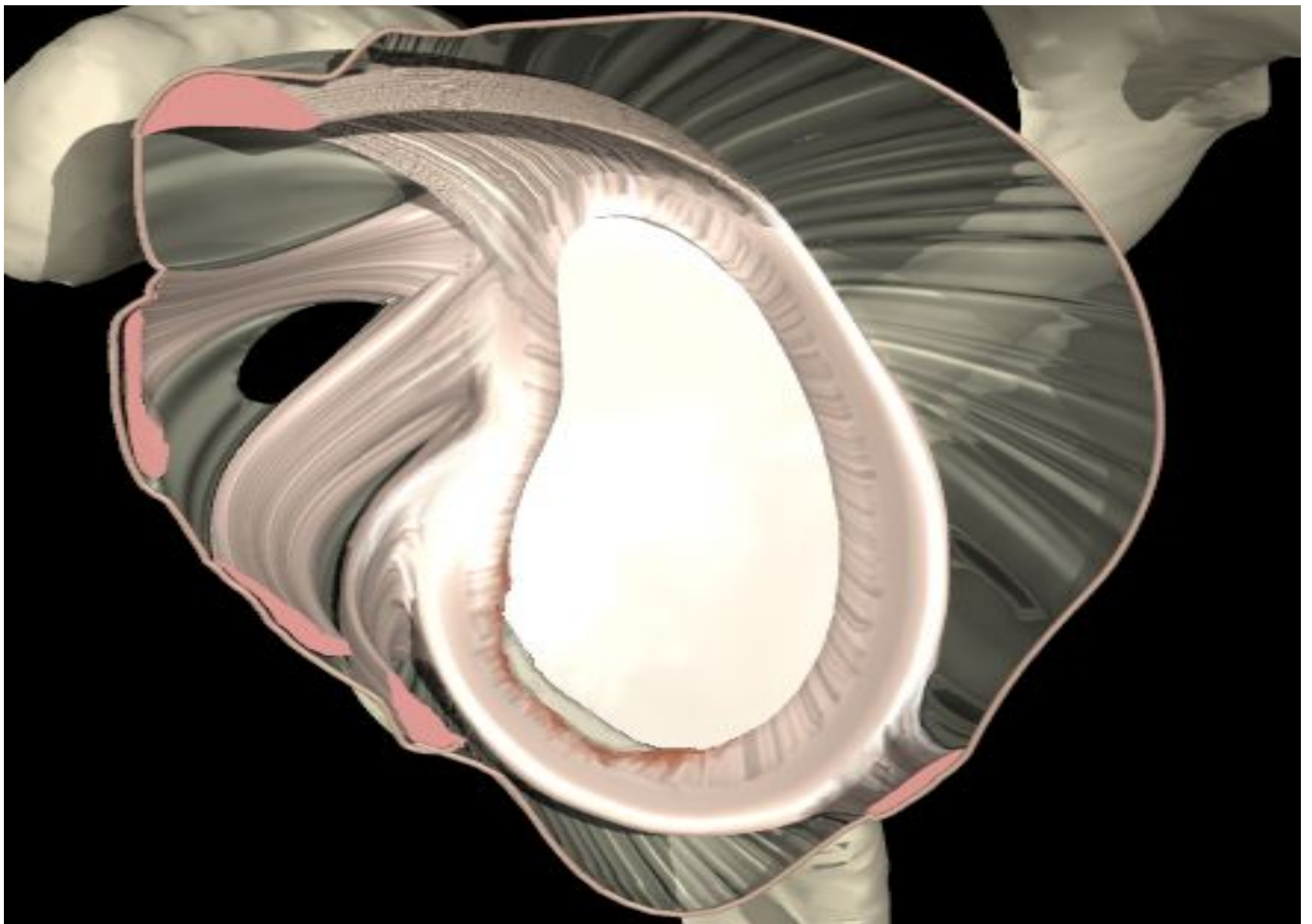


Vertical. ... through the biceps tendon and its sheath near the proximal opening of the humeral head (H&E, 100x magnification). The ... (x 38). The ... bone, shows the thick fibrous t...

In this segment of the sheath, the floor is formed primarily by a slip from the subscapularis (SC) and has the appearance of fibrocartilage (fc) where it lies close to the bone. The fibers crossing horizontally over the tendon are an extension (E) from the supraspinatus tendon.



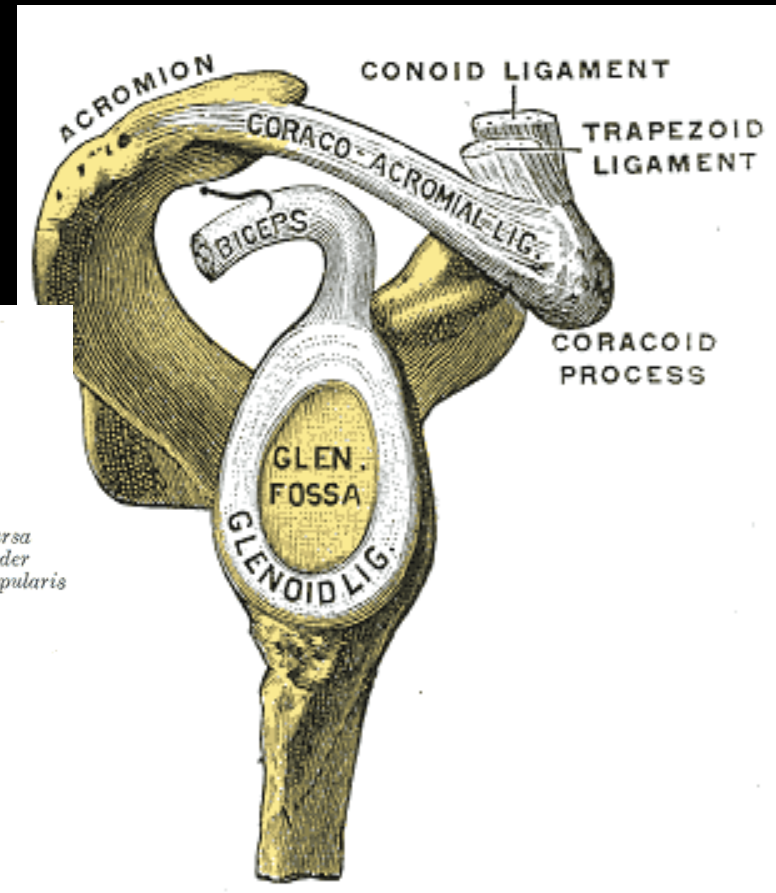
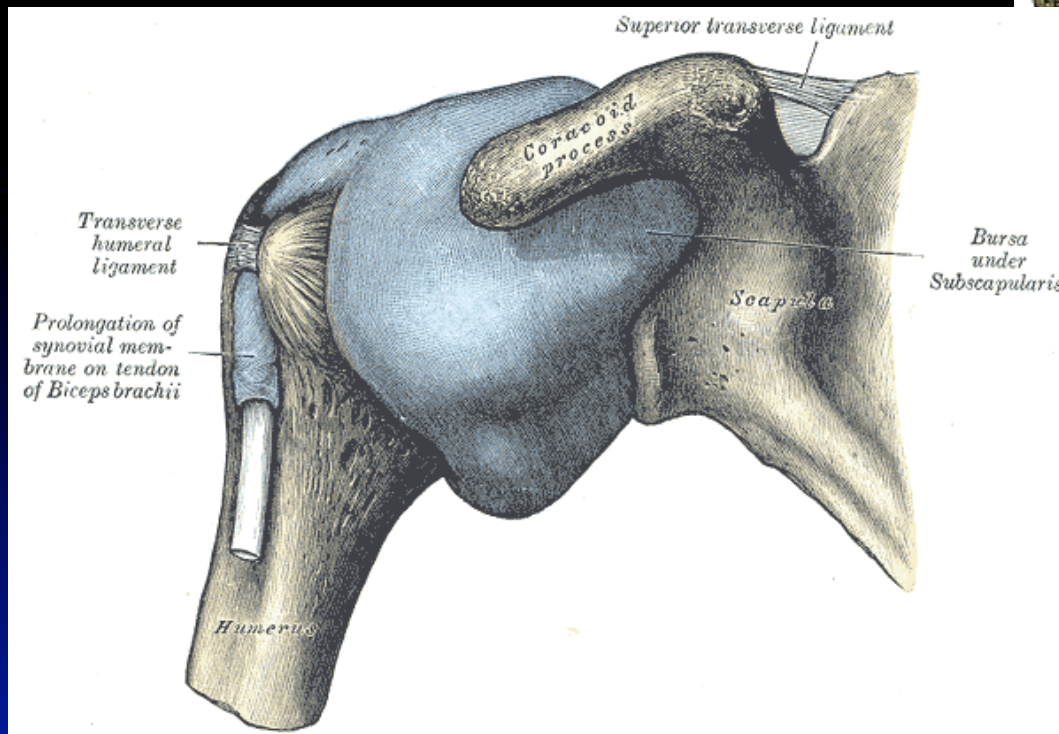




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Anatomy Review

- Shoulder joint capsule and cartilage



Anatomy

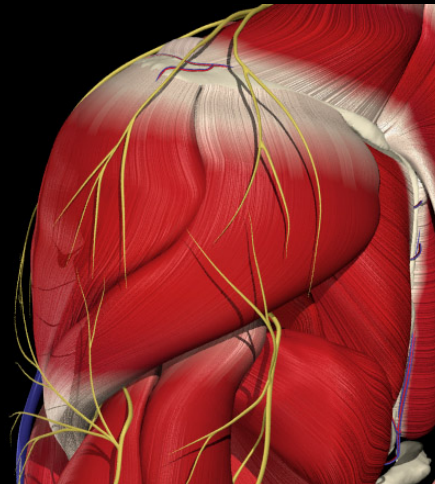
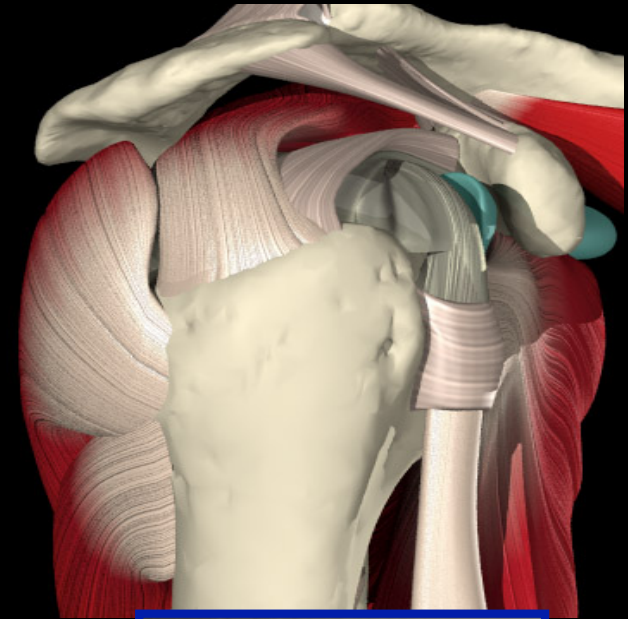
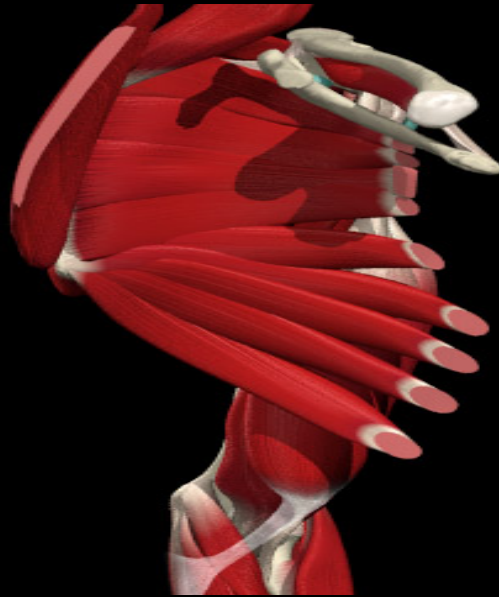
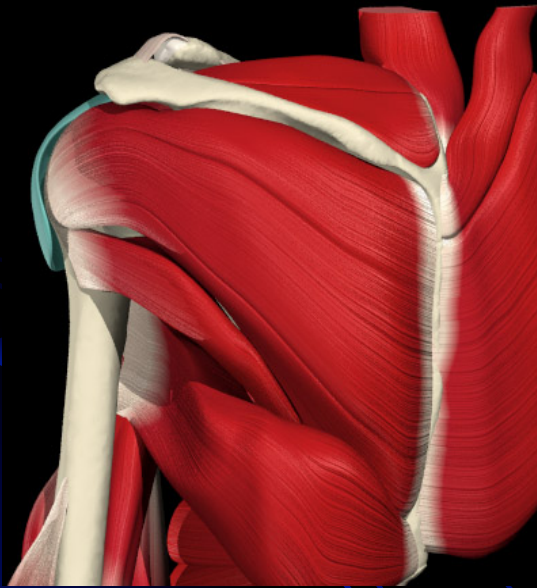
Stability

- Ligaments act in extremes
 - *static*
- Rotator cuff acts in mid-range via concavity-compression
 - *dynamic*
- Muscle-dependent joint



Anatomy

Dynamic Restraints → Rotator Cuff



Long Head of Biceps Tendon

proximal attachment

- supraglenoid tubercle
- superior labrum
- superior anterior and
- posterior labrum
- Capsule

insertion

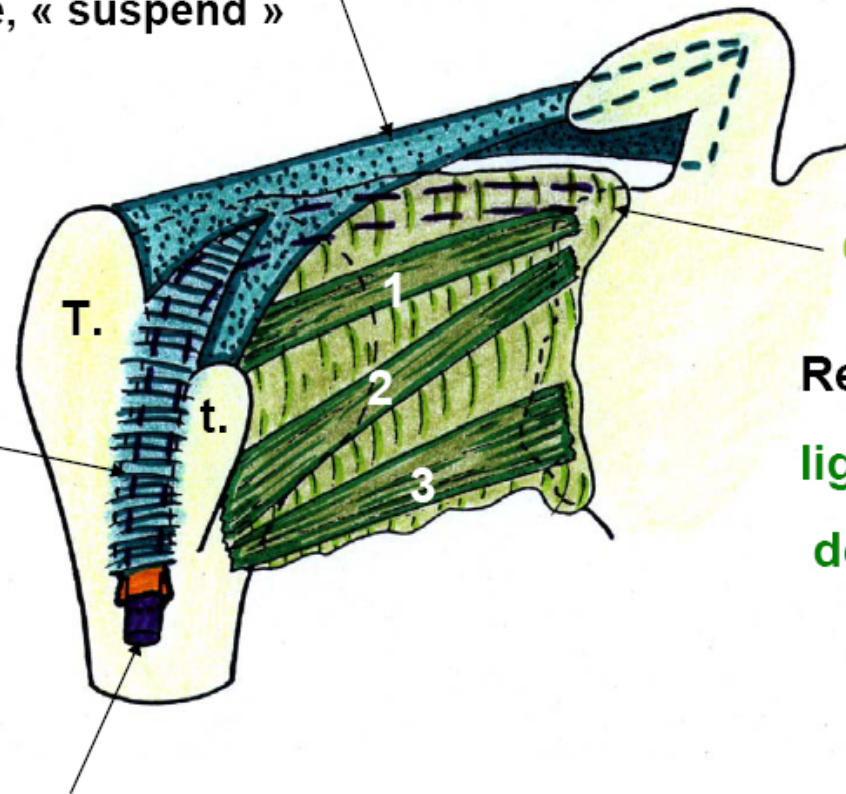
3.5 mm medial to glenoid rim

Ligament coraco-huméral:

Lig. à distance, « suspend »

L. huméral-transverse

Tendon du long biceps

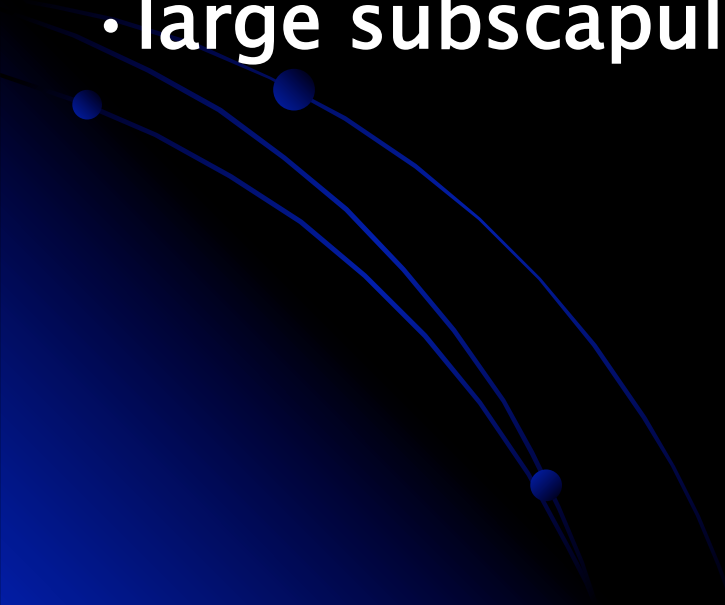


Capsule articulaire

**Renforcée par les
lig. Gléno-huméraux
de FARABEUF**

(1, 2, 3)

Labral Attachment to LHB

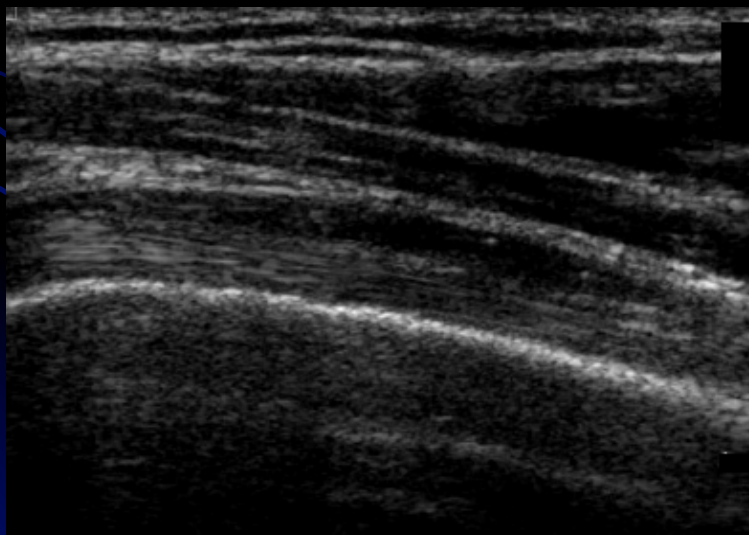
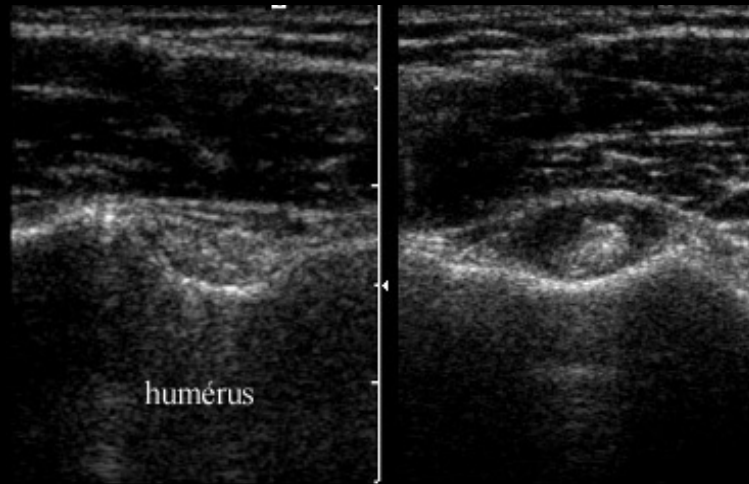
- superior–anterior labrum 55%
 - loose glenoid attachment 15%
 - firm glenoid attachment 15%
 - no glenoid attachment 20%
 - large subscapularis recess
- 

Epaule - Lésion Tendineuse : Le Biceps brachii L H

- Souvent associée à une lésion supérieure du bourrelet

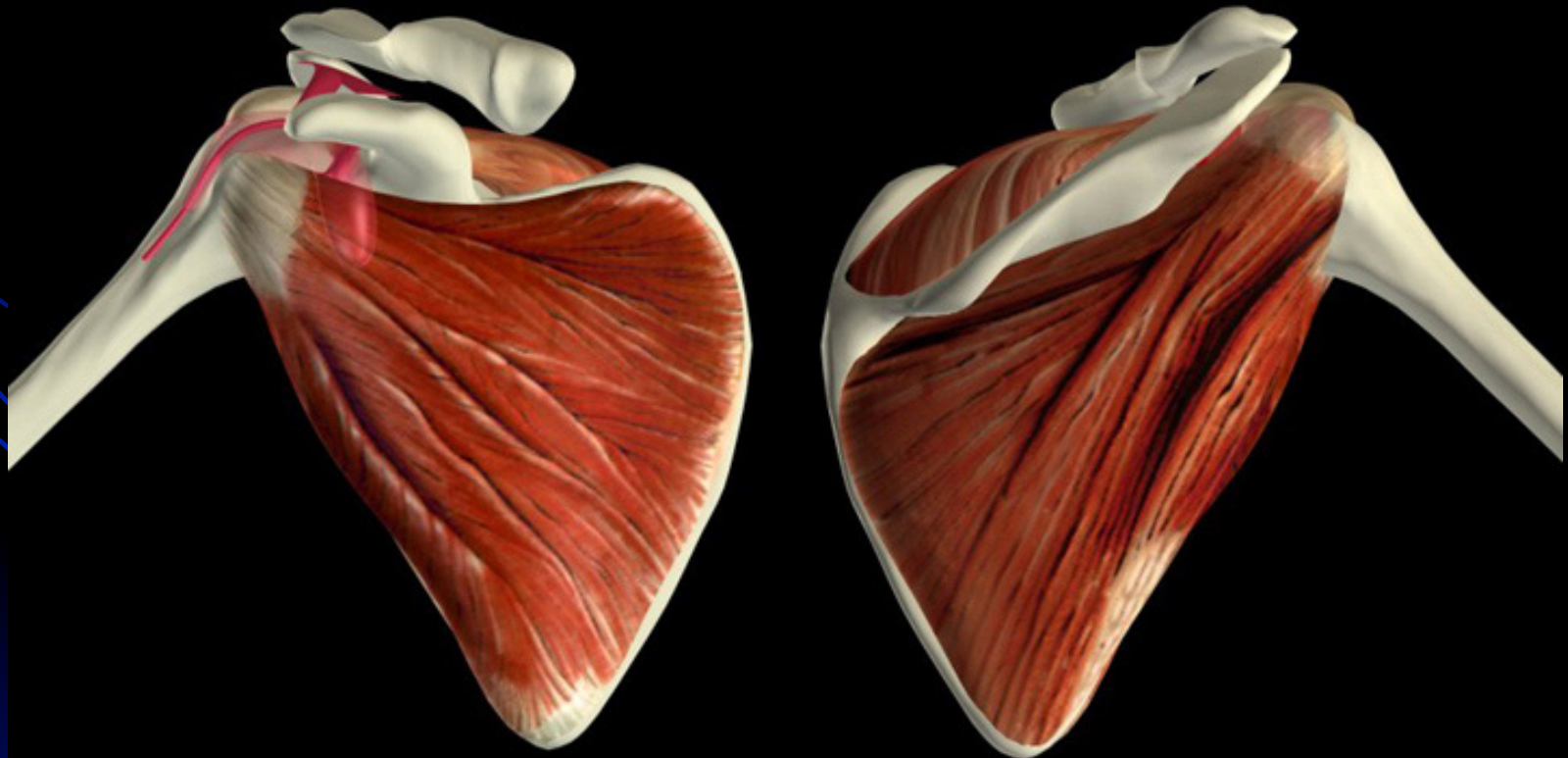


Tendon du long biceps



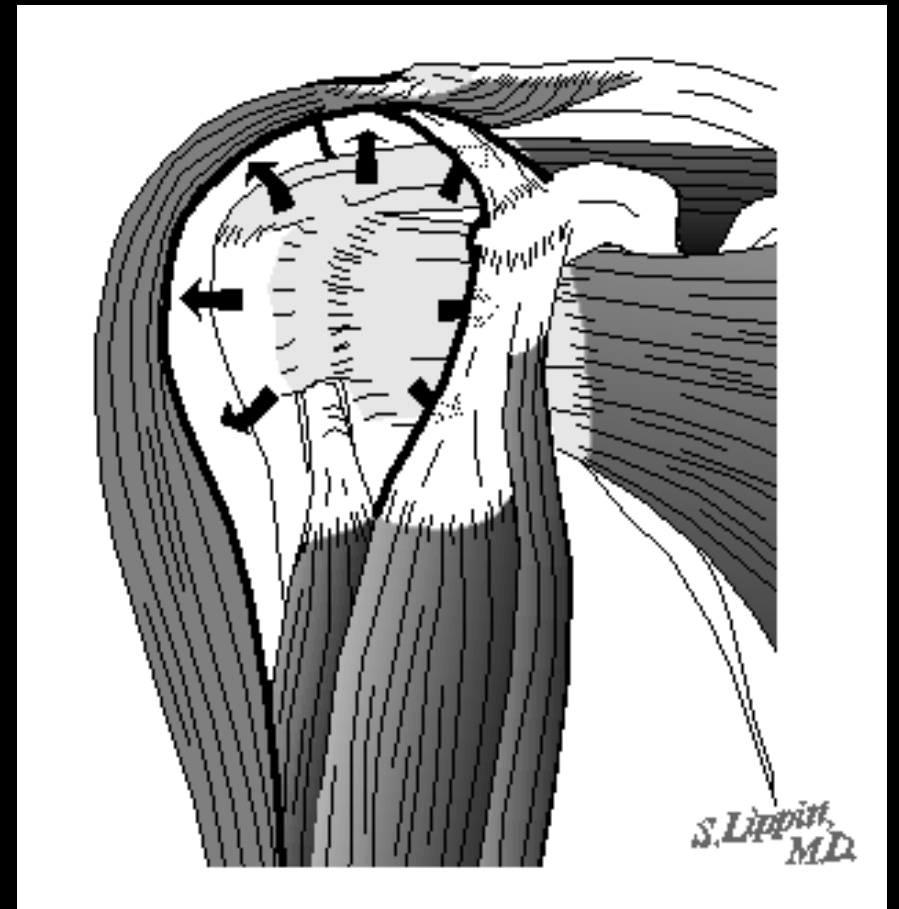
Epaule - Lésion Tendineuse : Biceps brachii L H + Subscapularis

- Lésions associées à un cisaillement du tendon subscapularis



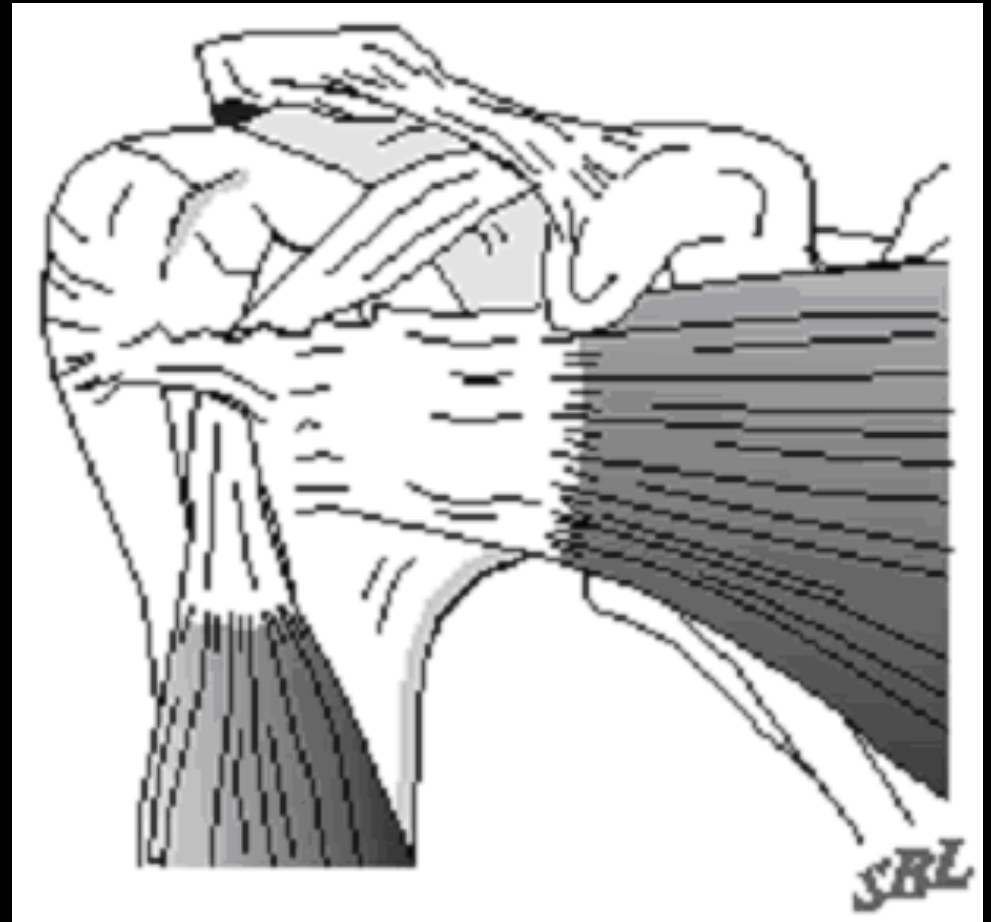
Epaule - Lésion Tendineuse : Biceps brachii L H + Subscapularis

- Mécanisme
lésionnel



Epaule - Lésion Tendineuse : Biceps brachii L H + Subscapularis

- Mécanisme
lésionnel

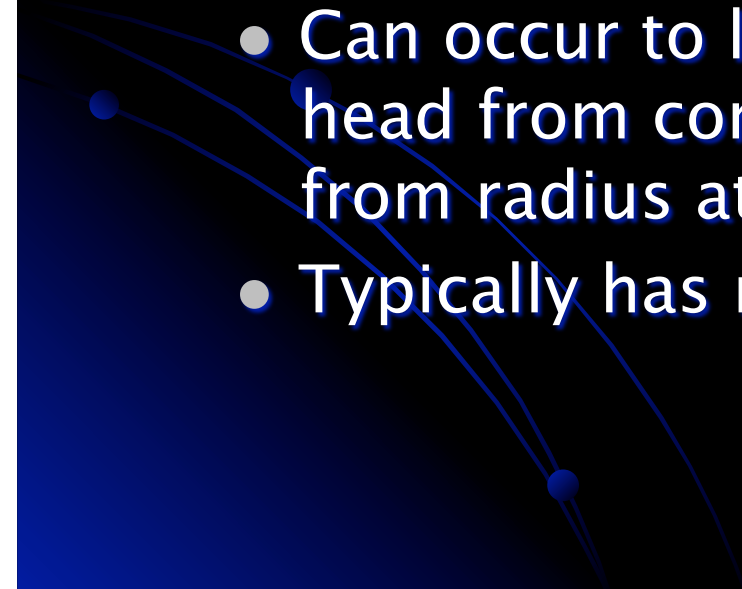


Epaule - Rupture Tendineuse : Biceps brachii L H

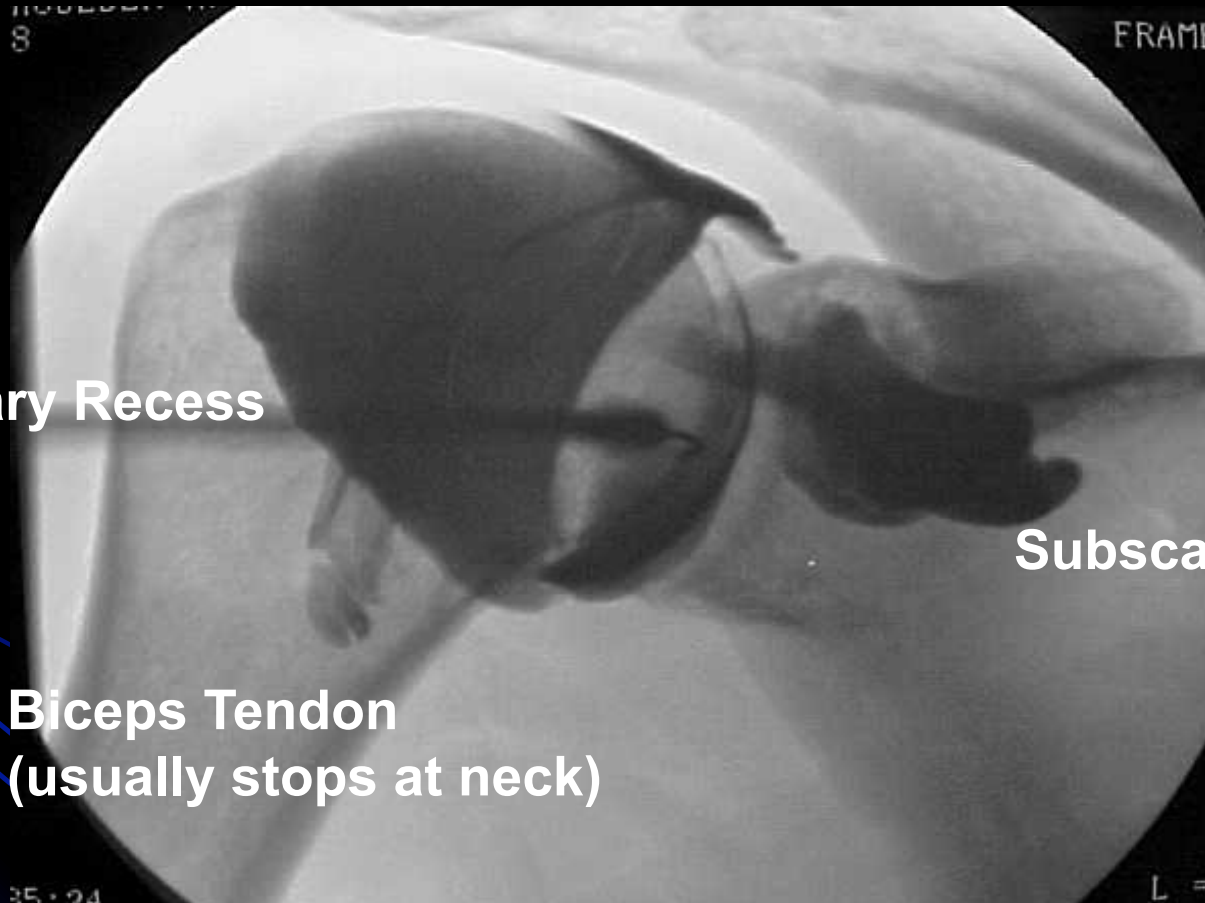
- Rupture totale du faisceau L H



Biceps Tendon Injuries

- Tendonitis
 - Secondary to biomechanical issues and/or repetitive overuse movements
 - Biceps tendon rupture
 - Can occur to long head from glenoid rim, short head from coracoid process or distal tendon from radius at elbow
 - Typically has resultant deformity
- 

Shoulder: normal capsule

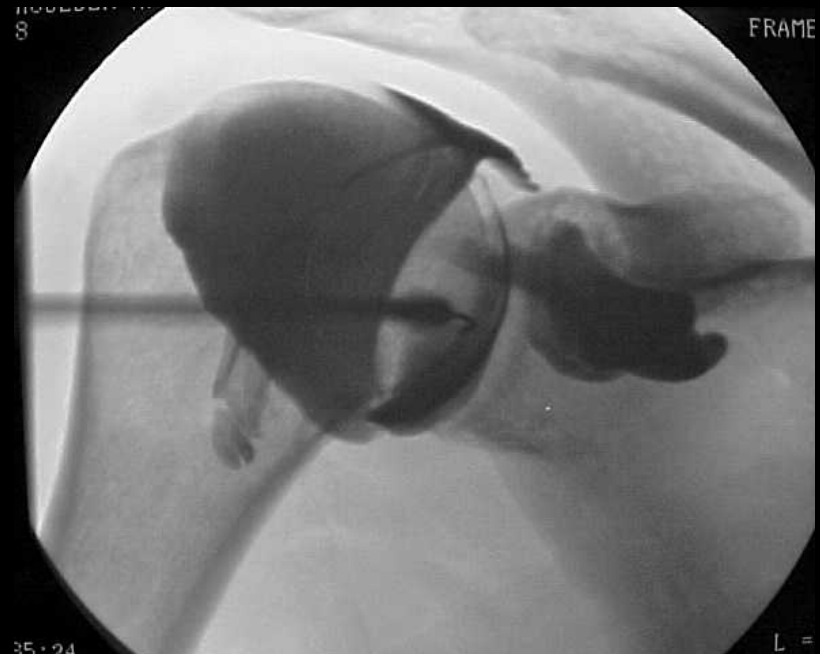


Axillary Recess

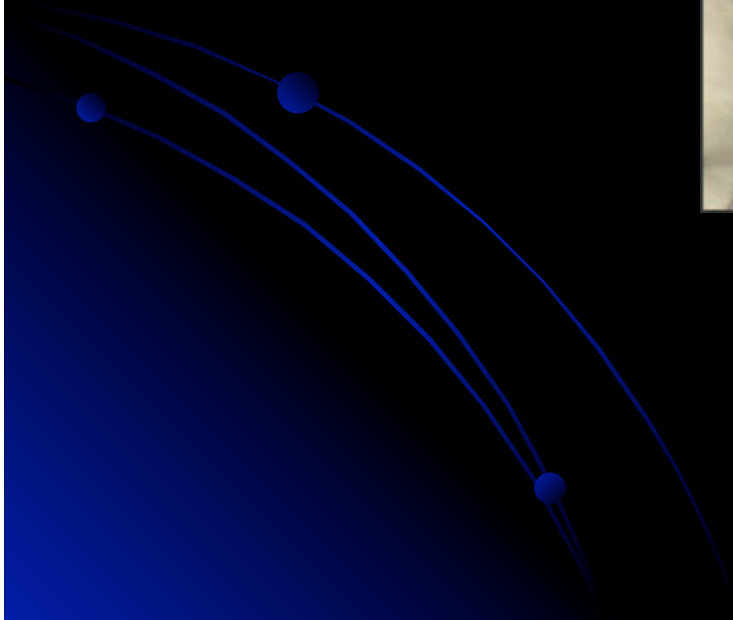
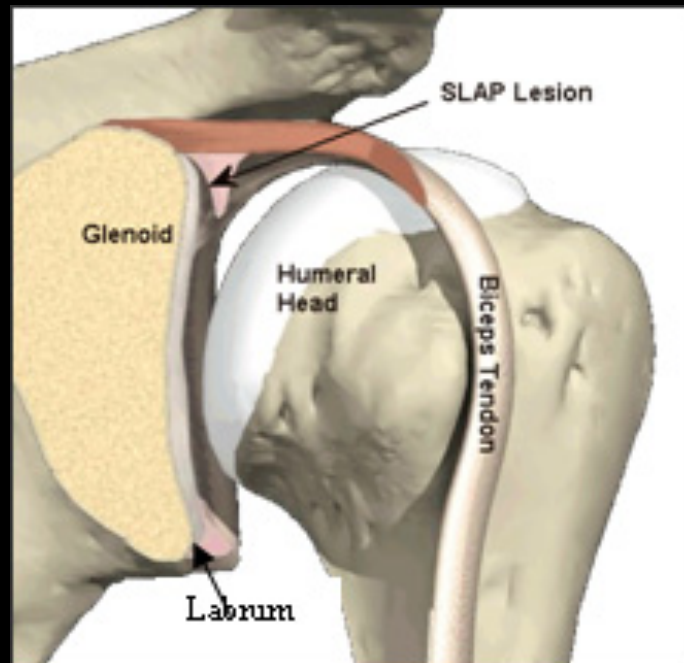
Subscapular recess

**Biceps Tendon
(usually stops at neck)**

Another Example:



Long head biceps

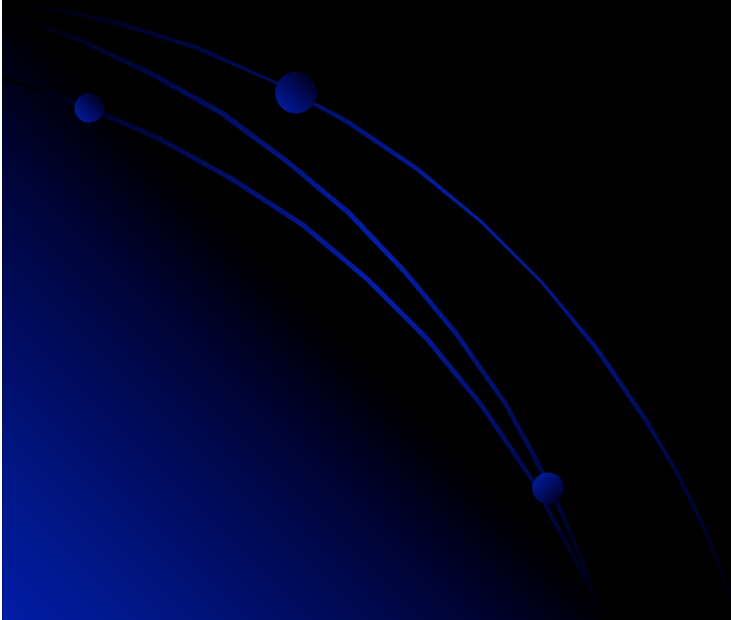


Long head biceps injection



Biceps strength testing

- Arms outstretched with palms up at level of shoulder
- Forced supination of hand with elbow flexed at 90 degrees



Bicipital Tenosynovitis

– Cause of Injury

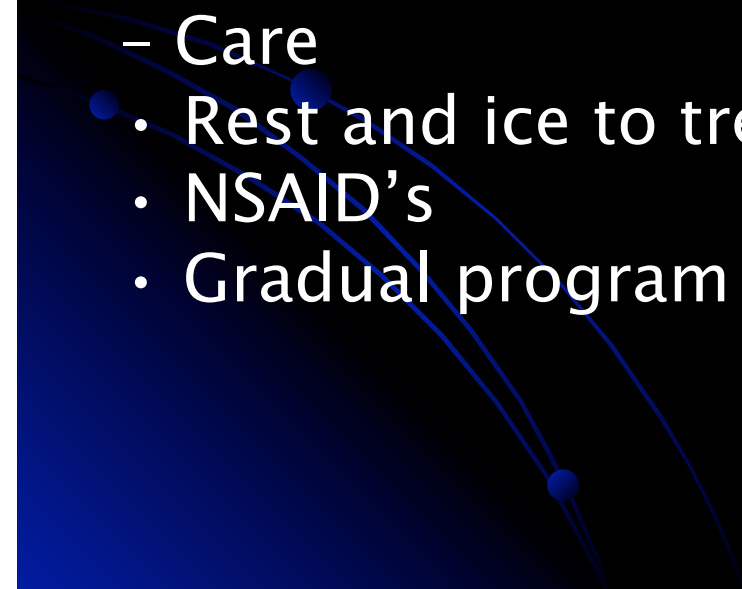
- Repetitive overhead athlete – ballistic activity that involves repeated stretching of biceps tendon causing irritation to the tendon and sheath

– Signs of Injury

- Tenderness over bicipital groove, swelling, crepitus due to inflammation
- Pain when performing overhead activities

– Care

- Rest and ice to treat inflammation
- NSAID's
- Gradual program of strengthening and stretching



Biceps Tendonitis

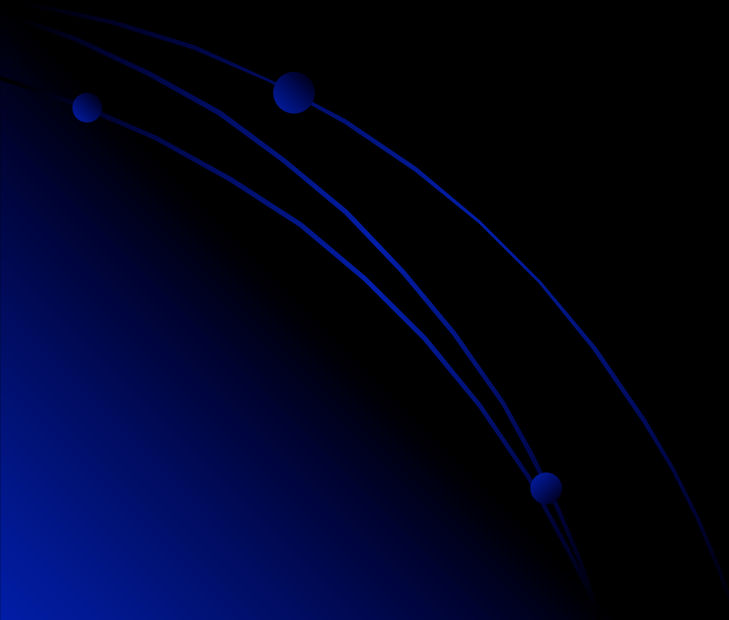
Biceps tendonitis is a result from repetitive overloading and friction as the long head of the biceps passes through the bicipital groove and under the transverse humeral ligament on its way to its attachment on the superior glenoid labrum. Biceps tendonitis is rarely a singular pathology; it generally occurs with impingement syndrome.

Biceps tendonitis

- Inflammation of long head of biceps
 - Passes through bicipital groove of anterior humerus
- Usually due to repetitive lifting or reaching
- Inflammation, microtearing, degenerative changes
- Up to 10% pts will have spontaneous rupture

Sx of biceps tendonitis

- Anterior shoulder pain
- Worse with lifting or overhead reaching
- Often pts point to bicipital groove
- Usually no weakness in elbow flexion



Exam for biceps tendonitis

- Bicipital groove tenderness
- Look for subacromial impingement
- Tendon rupture
- Test biceps strength
- Yergason test
 - Elbows flexed with forearms in front
 - Pt actively resisting external rotation
 - Tendon may pop out of bicipital groove when downward pressure applied to forearm

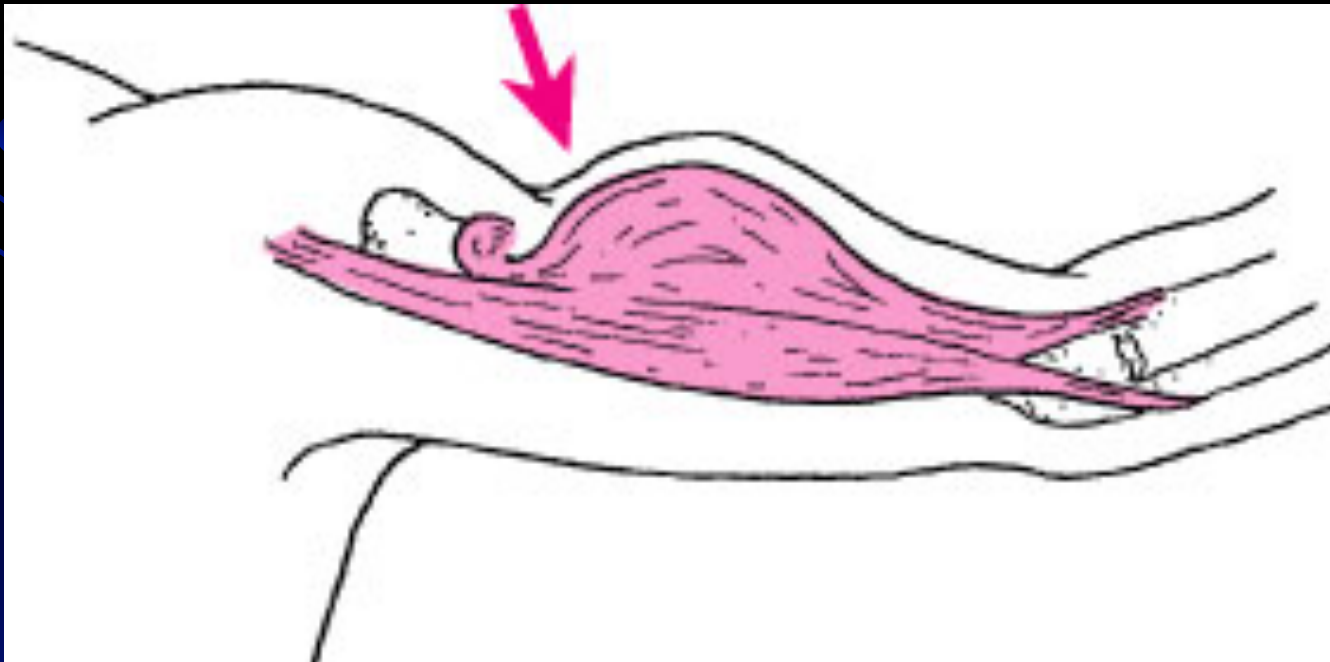
Ruptured biceps tendon

- Usually rotator cuff tear also present
- Get the “popeye” sign
- Rarely get significant weakness
 - Brachioradialis and short head of biceps provide 80-85% elbow flexor strength
- Tx is supportive



Biceps Brachii Rupture

- Etiology
 - Result of a powerful contraction
 - Generally occurs near origin of muscle at bicipital groove



Biceps Brachii Rupture

- Signs and Symptoms

- Athlete hears a resounding snap and feels sudden and intense pain
- Protruding bulge may appear near middle of biceps
- Definite weakness with elbow flexion and supination

- Management

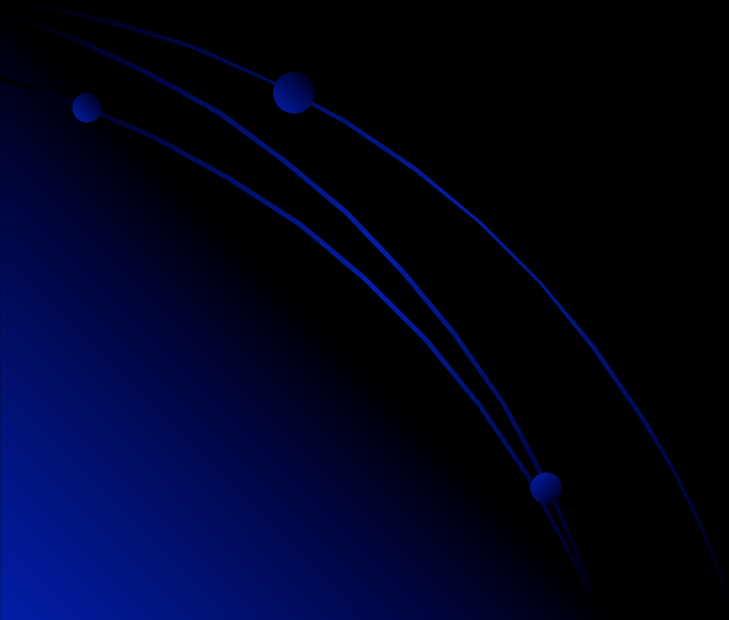
- Ice for hemorrhaging, place arm in sling and refer to athlete
- Athletes will require surgery
- Older individual will be able to rely on brachialis which serves as primary elbow flexor

Bicipital Tenosynovitis

- Etiology
 - Repetitive overhead athlete - ballistic activity that involves repeated stretching of biceps tendon causing irritation to the tendon and sheath
- Signs and Symptoms
 - Tenderness over bicipital groove, swelling, crepitus due to inflammation
 - Pain when performing overhead activities
- Management
 - Rest, ice and ultrasound to treat inflammation
 - NSAID's
 - Gradual program of strengthening and stretching

Radiology for biceps tendonitis

- Usually plain films unnecessary
- If tendon rupture present, then get plain films, U/S, or MRI
 - Look for rotator cuff tendonitis or tear



Tx of biceps tendonitis

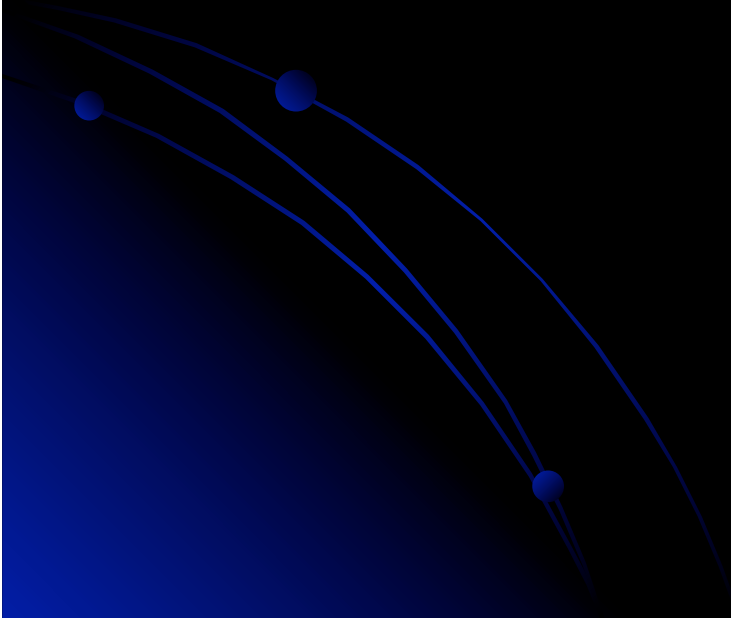
- Reduce inflammation
- Strengthen biceps muscle and tendon
- Prevent rupture

- Ice, NSAIDs, avoid aggravating motions
 - 5-10% risk of rupture with noncompliance
- Weighted pendulum
- Elbow flexion toning exercises
- Steroid injection
- Surgical referral if sx persist >3 months



Bicep Tendon Pathology

- Biceps Tendinitis
- Luxation of bicep tendon
- Long Head of biceps rupture



- Signs and symptoms

- Pain on P/A/RRROM
- Loss of function
- Overuse activity
- Tenderness
- Errythema
- Swelling
- Inflammation
- Crepitus

Biceps tendinitis

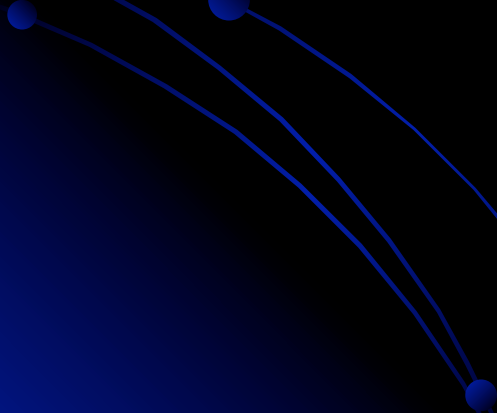
- √ Swelling, inflammation in biceps tendon
- √ Pain upper, anterior shoulder in biceps groove
- √ Pain with shoulder, elbow flexion
- √ Pain with lifting
- √ Weakness due to pain

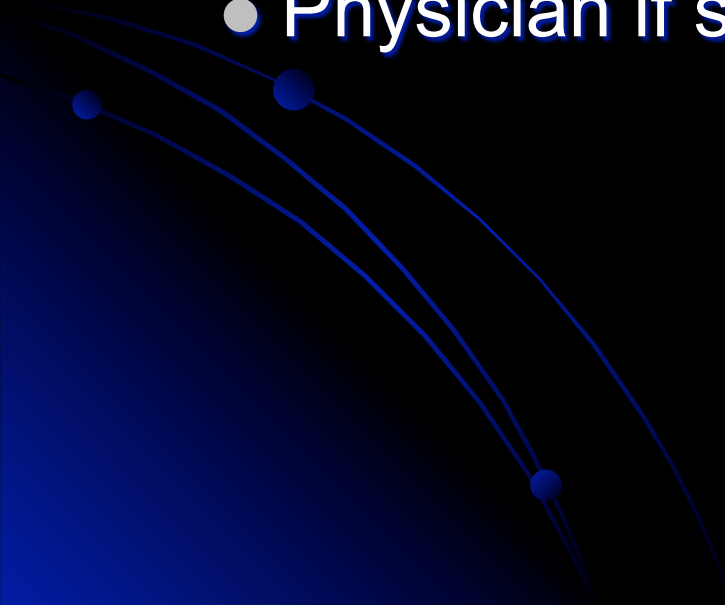


Shoulder Tendinitis

Treatment

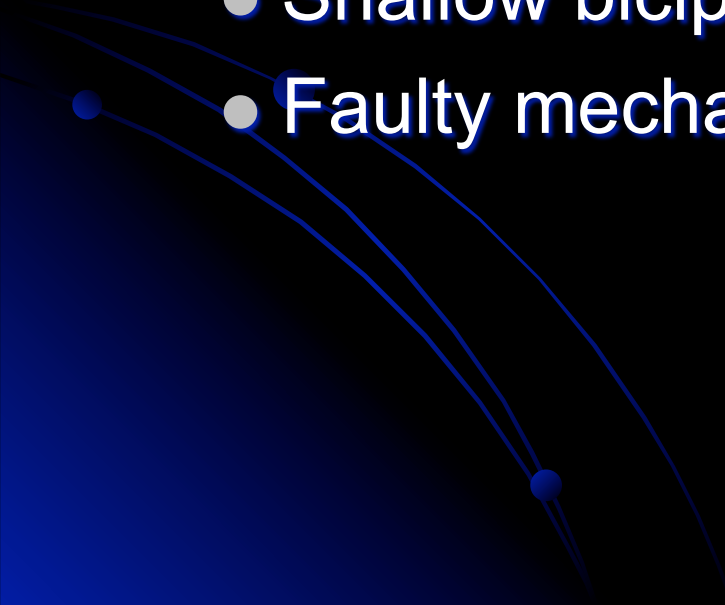
- √ Rest
- √ Oral medications – NSAIDs
- √ Cuff strengthening
- √ Cortisone Injection
- √ Physical Therapy – modalities
- √ Surgery – Biceps tenodesis



- Special Tests
 - A/P/RRROM
 - RC muscle test
 - Diagnostic Procedure
 - Physician if symptoms persist
- 

Luxation of biceps tendon

- Mechanism

- Inadequate muscle development
 - Overuse in throwing
 - Tearing of transverse humeral ligament
 - Shallow bicipital groove of humerus
 - Faulty mechanics
- 

- Signs and Symptoms

- Pain in anterior aspect of shoulder
- Loss of shoulder function
- Snapping sensation followed by dull ache in arm or arm feeling dead
- Tenderness over bicipital groove
- Inflammation

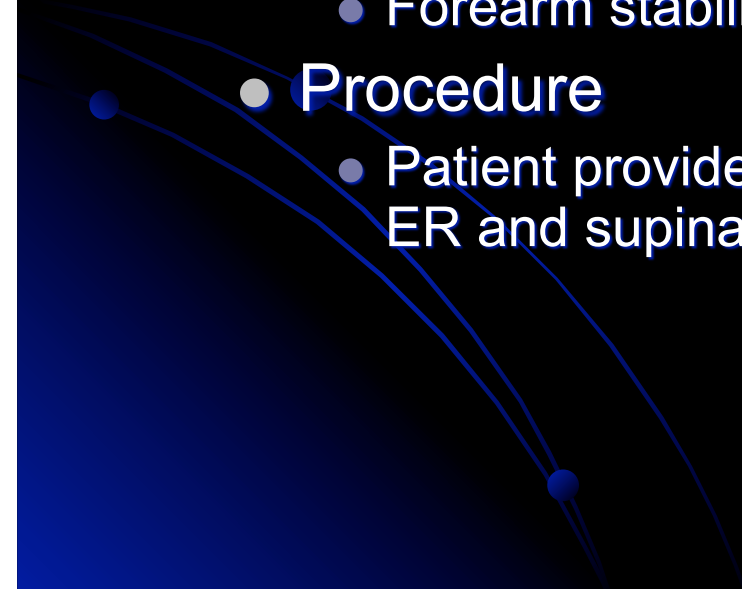
- Special Tests

- Yergason
- Speed's
- Ludington

- Diagnostic Procedure

- Refer to physician

Special Tests for Biceps Tendon Subluxation

- Yergason's
 - Patient
 - Sitting or standing
 - Elbow flexed at 90 degrees
 - Examiner
 - Stabilize olecranon inferiorly and maintained to thorax
 - Forearm stabilize proximal to wrist
 - Procedure
 - Patient provides resistance while examiner moves GH joint in ER and supination
- 

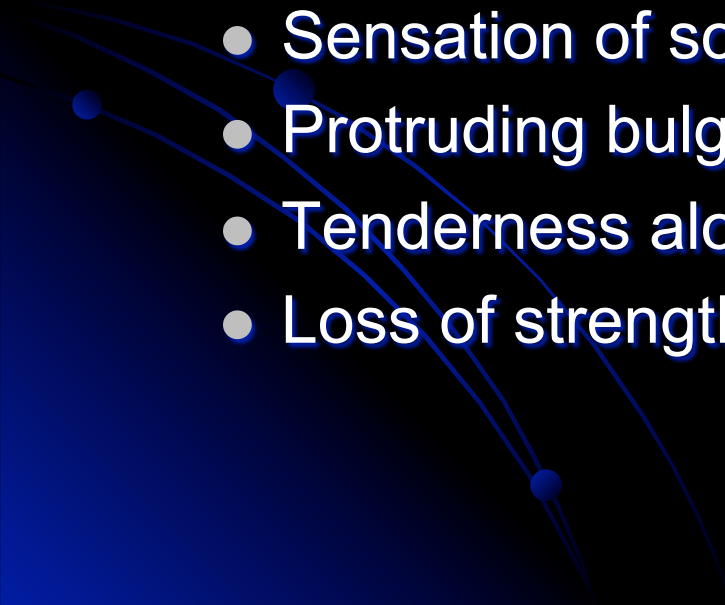
Tests for Bicep tendon stability

- Speed's
 - Patient
 - Sitting or standing
 - Elbow extended/ GH jt in neutral or slightly extended to stretch biceps brachii
 - Examiner
 - One hand over bicipital groove (stabilizing shoulder)
 - Forearm stabilized proximal to wrist
 - Procedure
 - Examiner resists flexion of GH joint and elbow while palpating for tenderness over bicipital groove

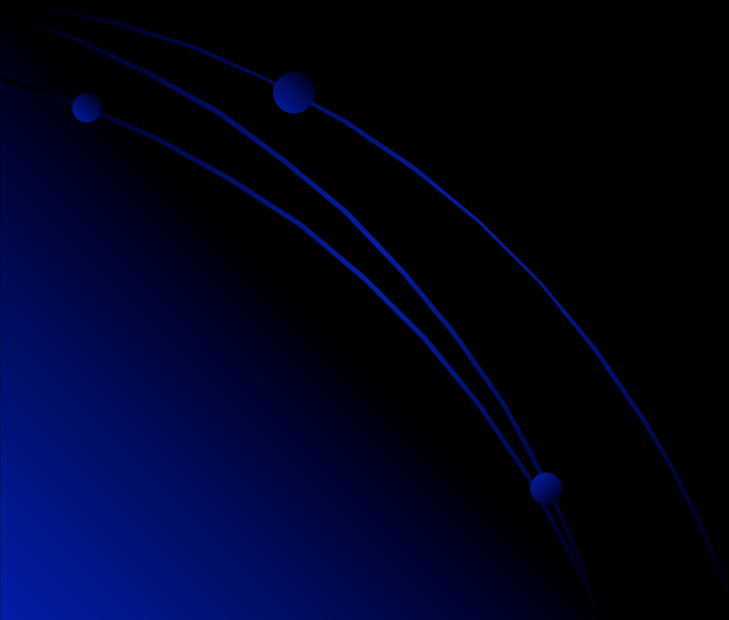
Bicep Tendon Rupture

- Ludington's
 - Patient
 - Standing or sitting
 - Hands on top of head with fingers interlocked
 - Examiner
 - Standing behind patient palpating long head of biceps brachii
 - Procedure
 - Pt. Contracts bicep brachii by applying force to top of head
 - Examiner palpates long head of biceps tendon

Long head of biceps rupture

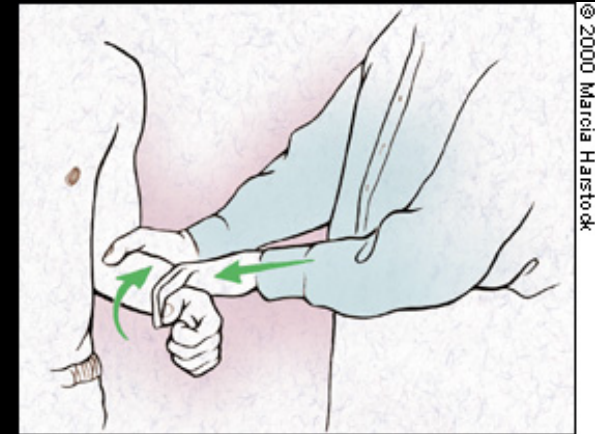
- Mechanism
 - Violent contraction against resistance
 - Symptoms/signs
 - Pain
 - Loss of function
 - Sensation of something rolling up arm
 - Protruding bulge in biceps
 - Tenderness along long head
 - Loss of strength
- 

- Special Tests
 - Ludington's test
- Diagnostic Procedure
 - Refer to ortho



Yergason test

- Yergason test for biceps tendon instability or tendonitis. The patient's elbow is flexed to 90 degrees, and the examiner resists the patient's active attempts to supinate the arm and flex the elbow.



Yergason Test 1



Yergason Test 2



Yergason Test

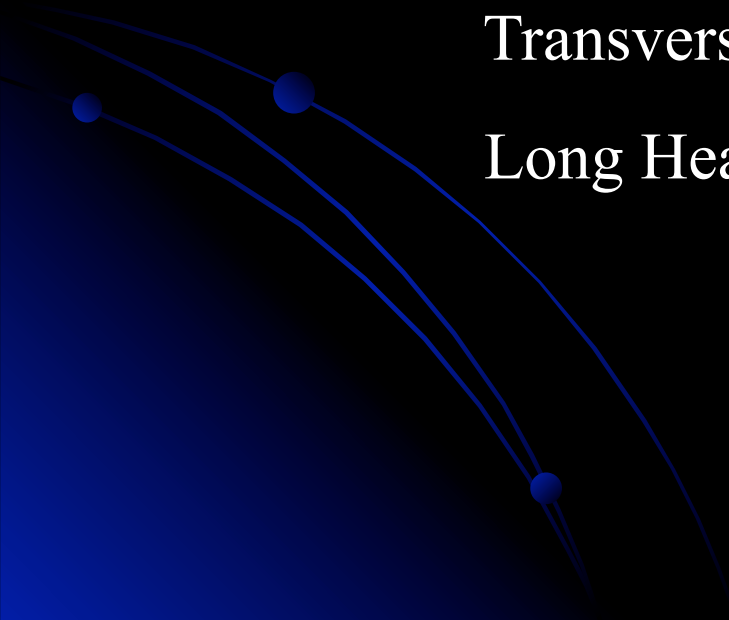
- Positive Findings

pain

popping

Transverse Humeral Ligament

Long Head of the Biceps irritation

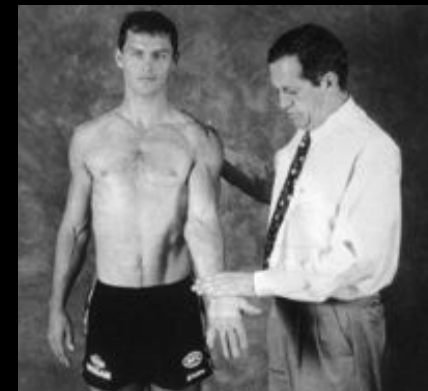


Speed's Test



Speed's Maneuver

- Forward flex the shoulder against resistance while maintaining the elbow in extension and the forearm in supination. Pain or tenderness in the bicipital groove indicates bicipital tendinitis.



Speed's Test

Positive Findings

Pain

Weakness

Long Head of Biceps Tendon

A diagram illustrating the findings of Speed's Test. It features three blue curved lines that sweep from the left side towards the bottom right. Three blue circular markers are placed on these lines: one on the uppermost line, one on the middle line, and one on the lowermost line. The text 'Pain' is positioned above the middle line, 'Weakness' is positioned between the middle and lower lines, and 'Long Head of Biceps Tendon' is positioned below the lowermost line.

- Contusion of biceps

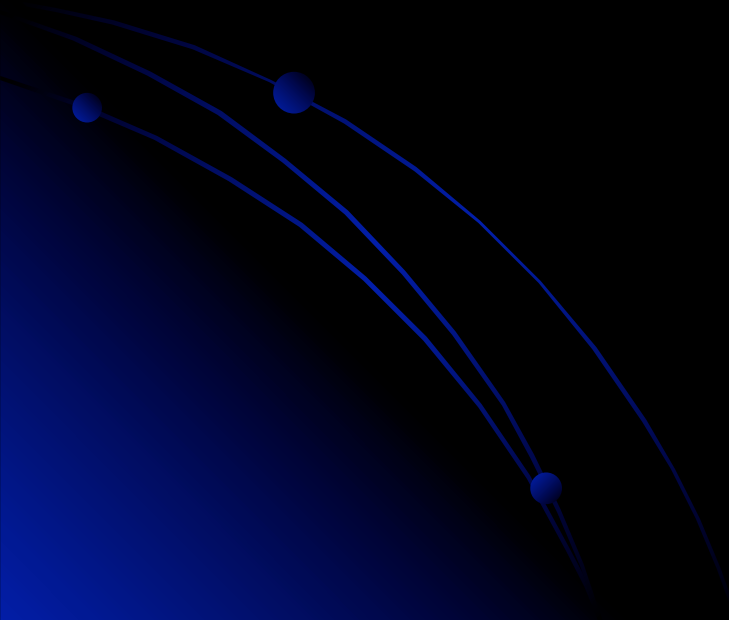
- Mechanism

- Direct Trauma

- Signs and Symptoms

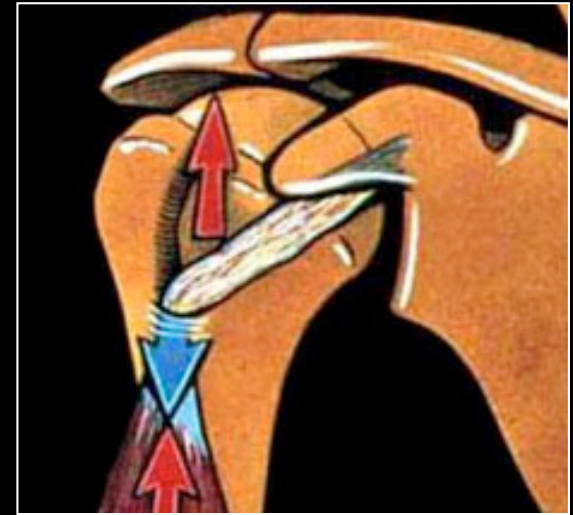
- Pain
- Loss of elbow flexion and extension
- Transitory paralysis
- Pt. Tenderness
- Ecchymosis
- Hematoma Formation
- Inflammation

- Special Tests
 - A/P/RRROM
- Diagnostic Procedures
 - Refer if symptoms persist





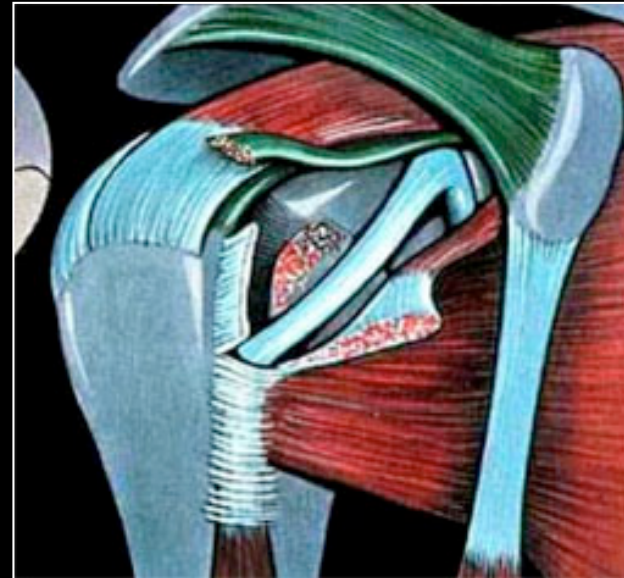
Lésions du tendon du long biceps



Dégénérescence, rupture possible, luxation en avant de la coulisse bicipitale
Ce qui favorise l'ascension de la tête et aggrave le conflit

Traitement : ténotomie et réinsertion sur l'humérus

Lésions du tendon du long biceps



La luxation en avant de la coulisse bicipitale s'accompagne parfois d'une désinsertion partielle du tendon du sous-scapulaire

Traitement : ténotomie et réinsertion sur l'humérus du biceps et du sous-scapulaire



SPECIAL REHABILITATION APPLICATION

● BICEPS TENDON INJURIES

- ✓ The most common injury seen in the biceps tendon is tendinitis
- ✓ Rehabilitation treatment must include an assessment of the rotator cuff, because pathology in this location is often related to biceps pathology.
- ✓ Control of pain, swelling, and inflammation is an initial goal of treatment.
- ✓ Therapeutic exercises progress as tolerated to include a strengthening sequence similar to that listed for conditions discussed earlier.
- ✓ It should also obviously include supination and elbow flexion exercises.

Ultrasound Case: Biceps Tendonitis and Sub-Deltoid Bursitis

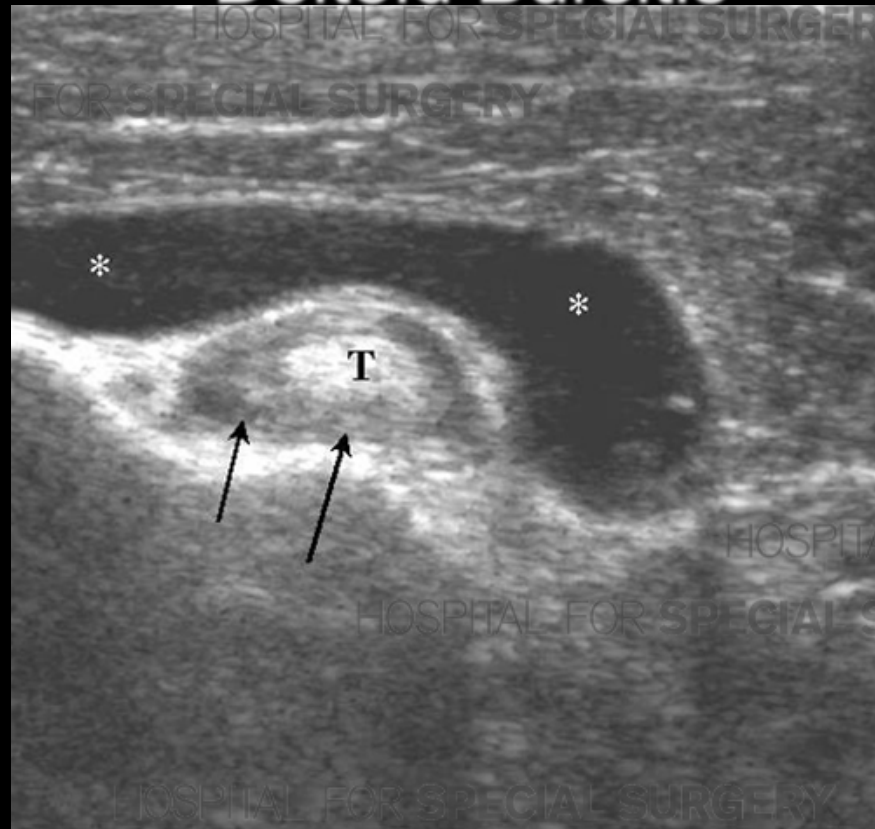


- Diagnosis: Biceps Tendonitis and Sub-Deltoid Bursitis.
- History: Patient complaining of anterior pain over shoulder.
- Findings: Long axis extended field of view image of the biceps tendon (t). The tendon is surrounded abnormal soft tissue (arrows) within the tendon sheath. Fluid (*) is present in the subdeltoid bursa overlying the biceps tendon.
- Treatment: Biceps tendon sheath injection.

HOSPITAL
FOR
SPECIAL
SURGERY



Ultrasound Case: Biceps Tendonitis and Sub-Deltoid Bursitis

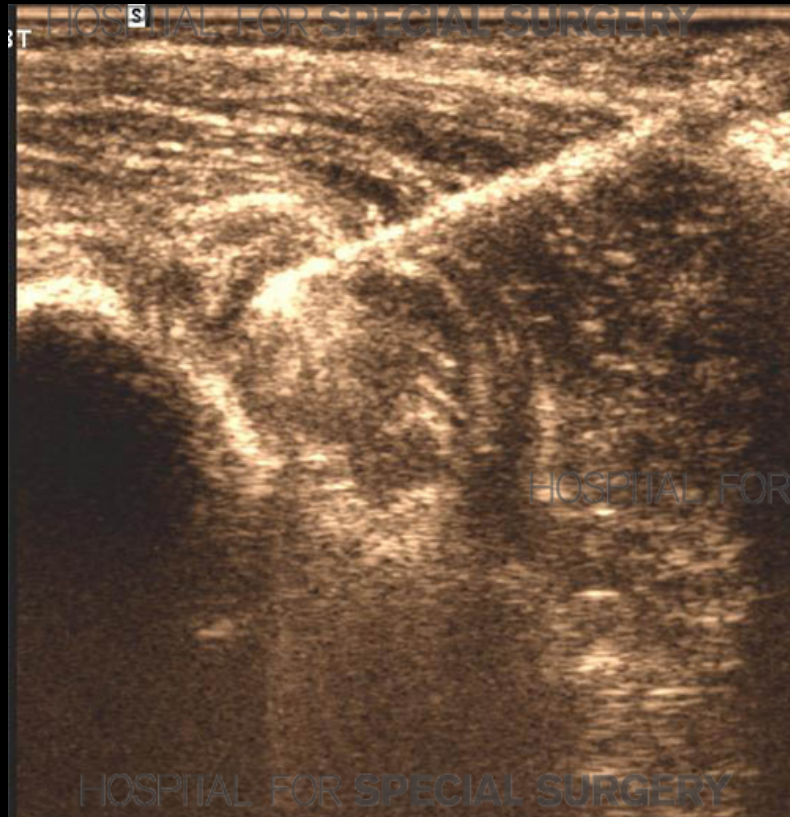


- Diagnosis: Biceps Tendonitis and Sub-Deltoid Bursitis.
- History: Patient complaining of anterior pain over shoulder.
- Findings: Transverse view of biceps tendon (t) shows it to be slightly subluxed and surrounded by soft tissue (arrows). Fluid (*) overlies the tendon in the subdeltoid bursa.
- Treatment: Biceps tendon sheath injection.

HOSPITAL
FOR
SPECIAL
SURGERY



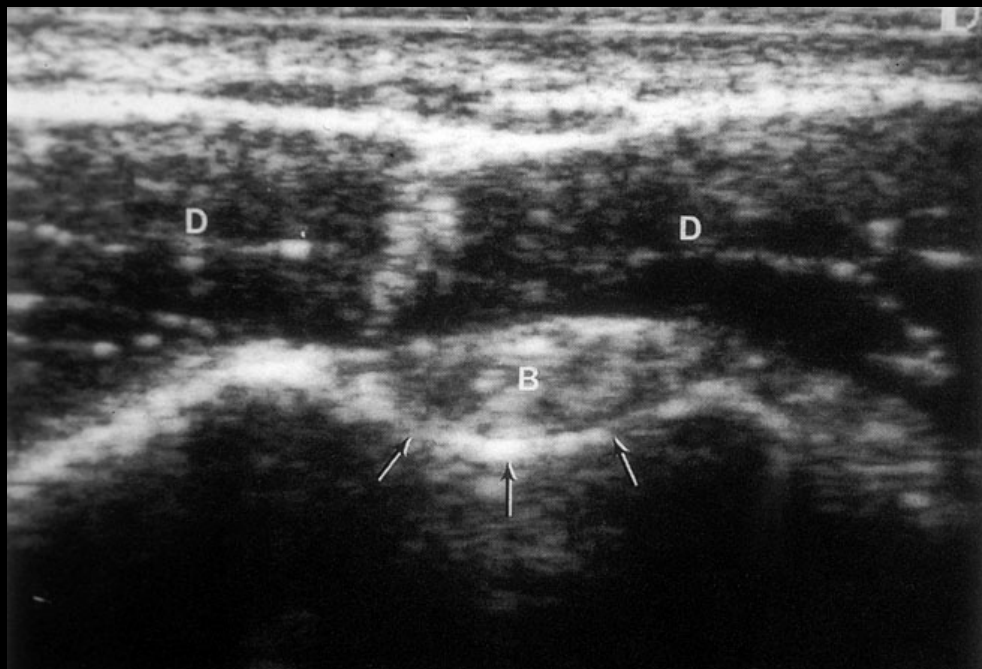
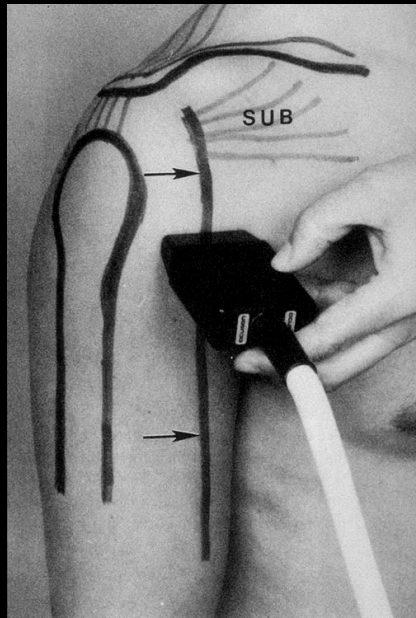
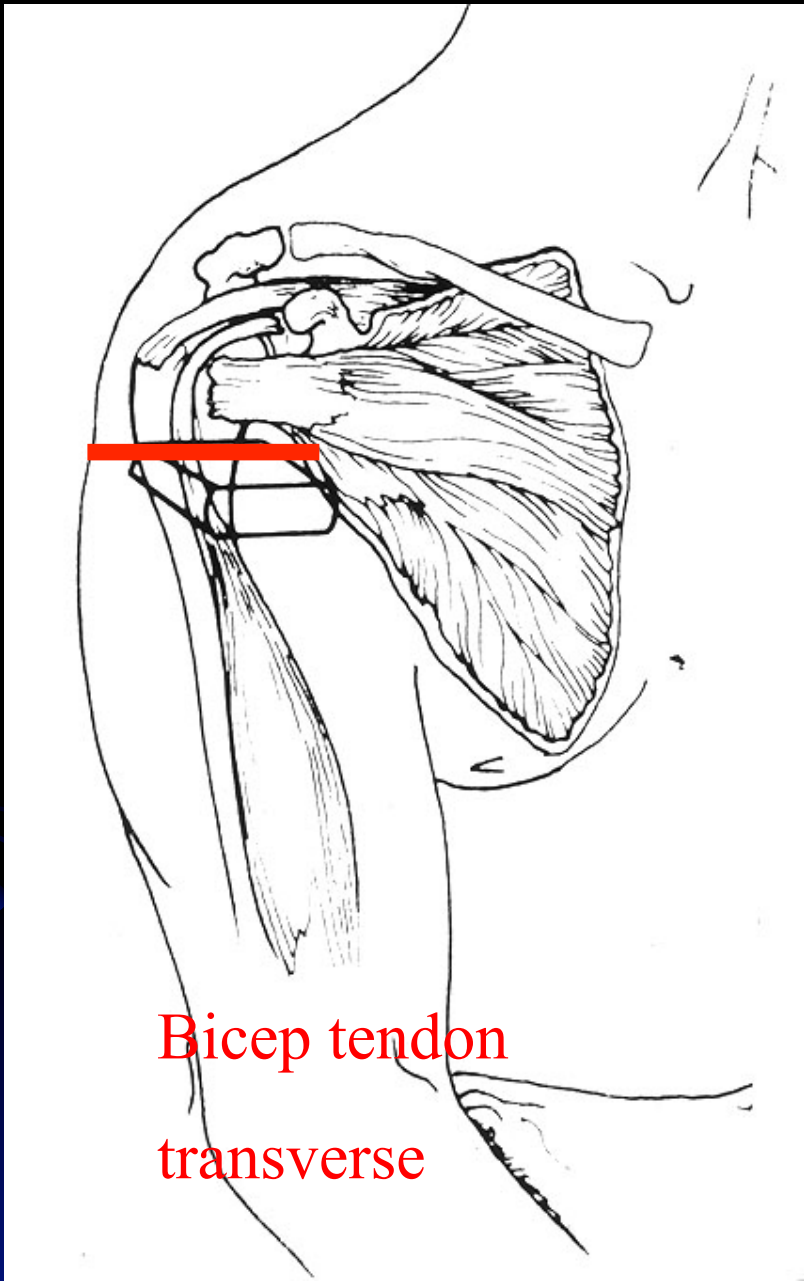
Ultrasound Case: Biceps Tendonitis and Sub-Deltoid Bursitis

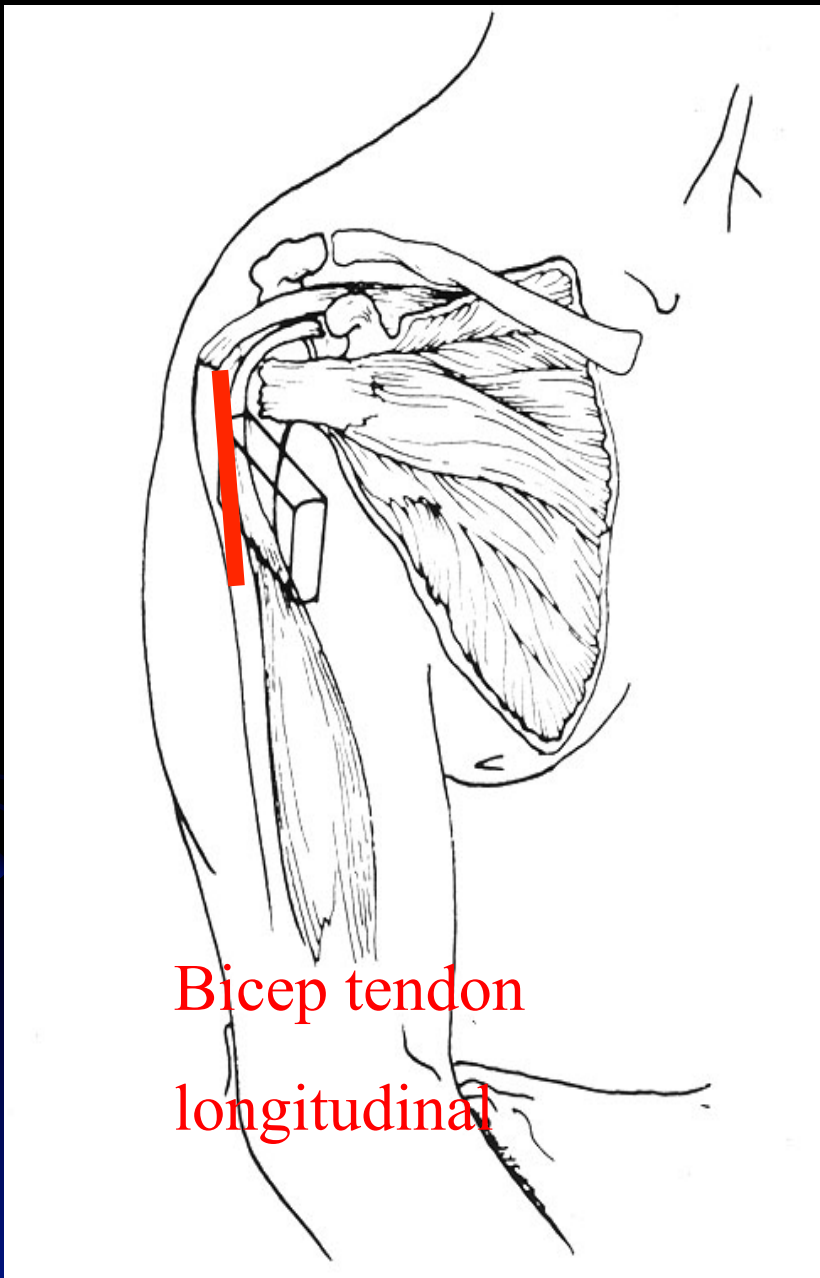


- Diagnosis: Biceps Tendonitis and Sub-Deltoid Bursitis.
- History: Patient complaining of anterior pain over shoulder.
- Findings: Biceps tendon sheath injection using ultrasound guidance. The needle is next to the tendon and within the sheath. The bursa is avoided as well as the tendon with the benefit of real time guidance.
- Treatment: Biceps tendon sheath injection.

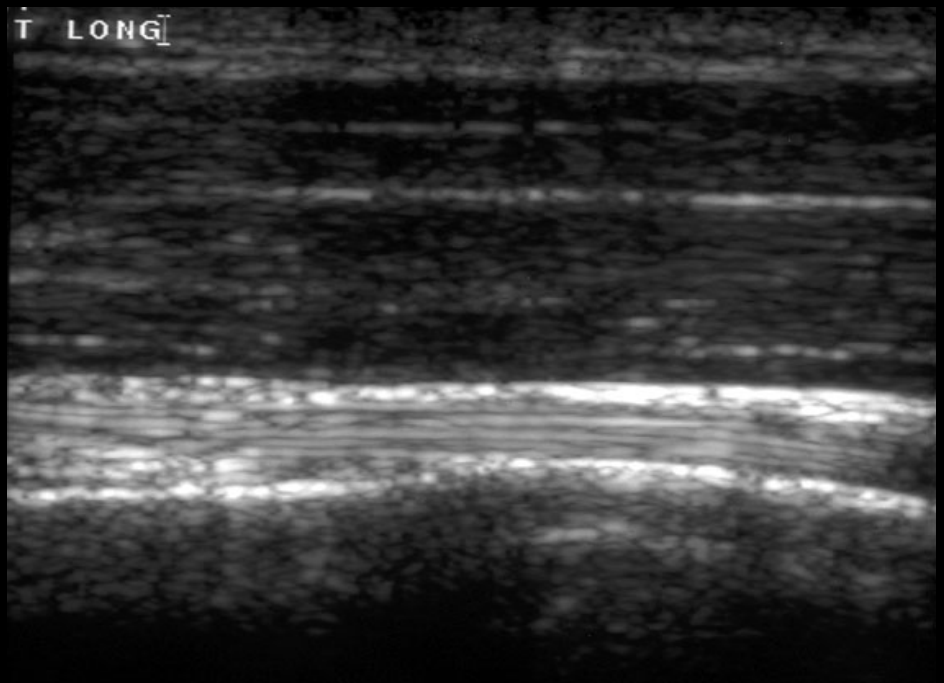
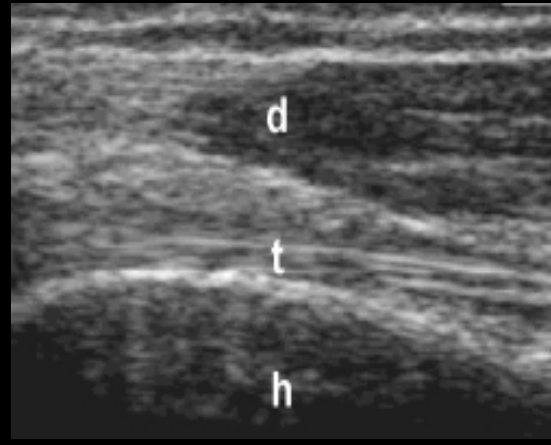
HOSPITAL
FOR
SPECIAL
SURGERY



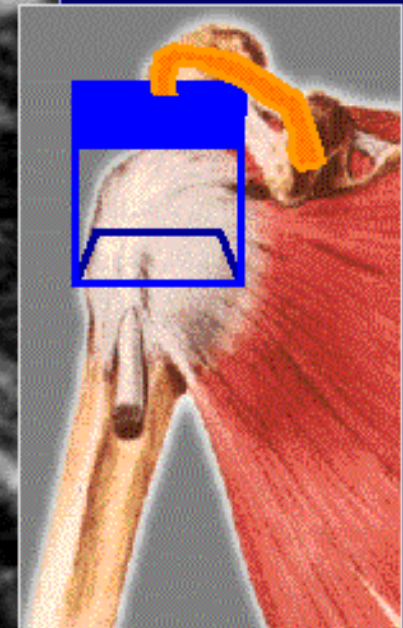
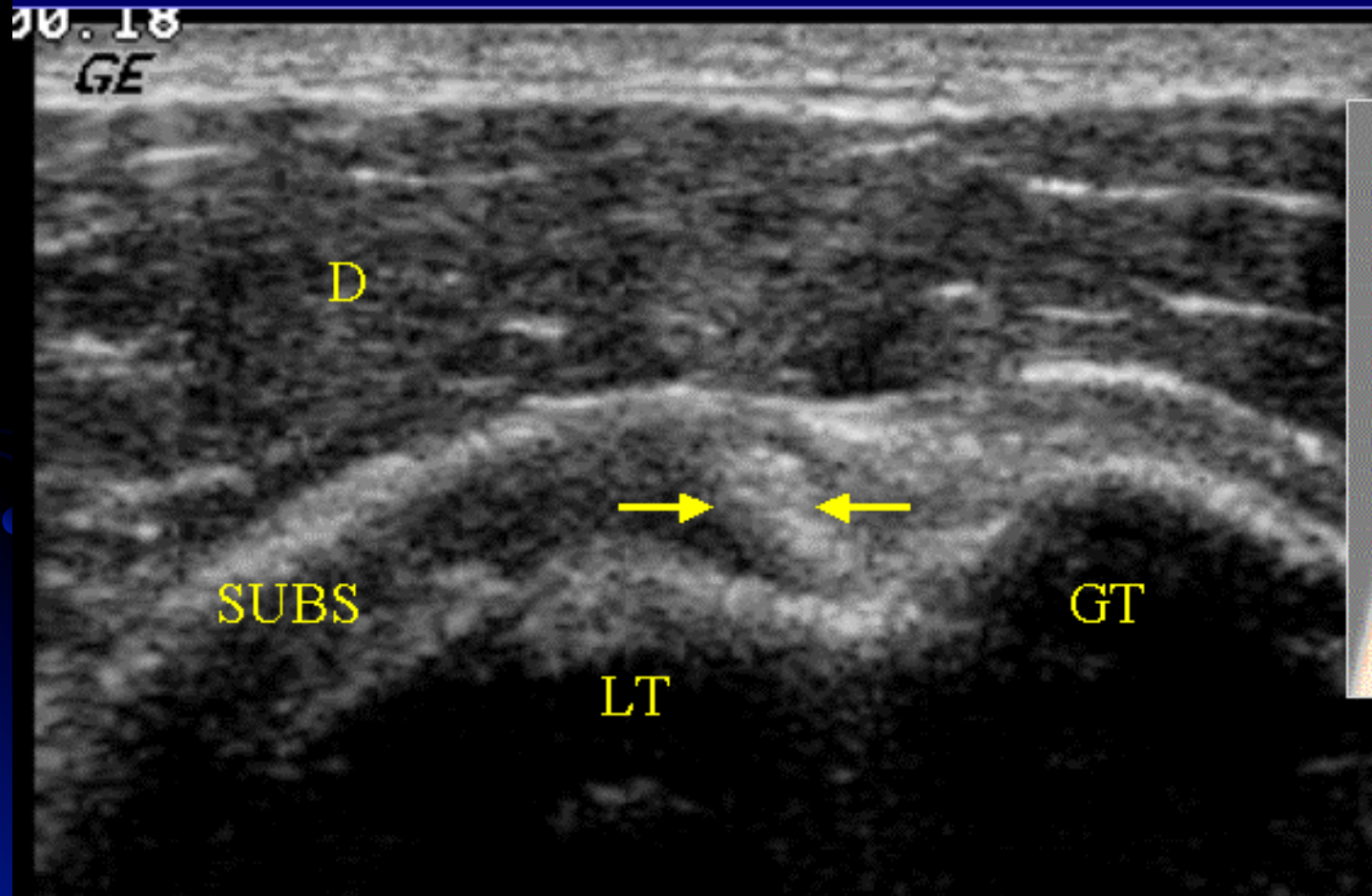




Bicep tendon
longitudinal

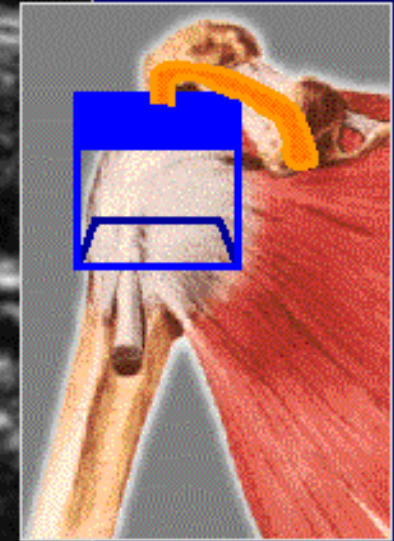
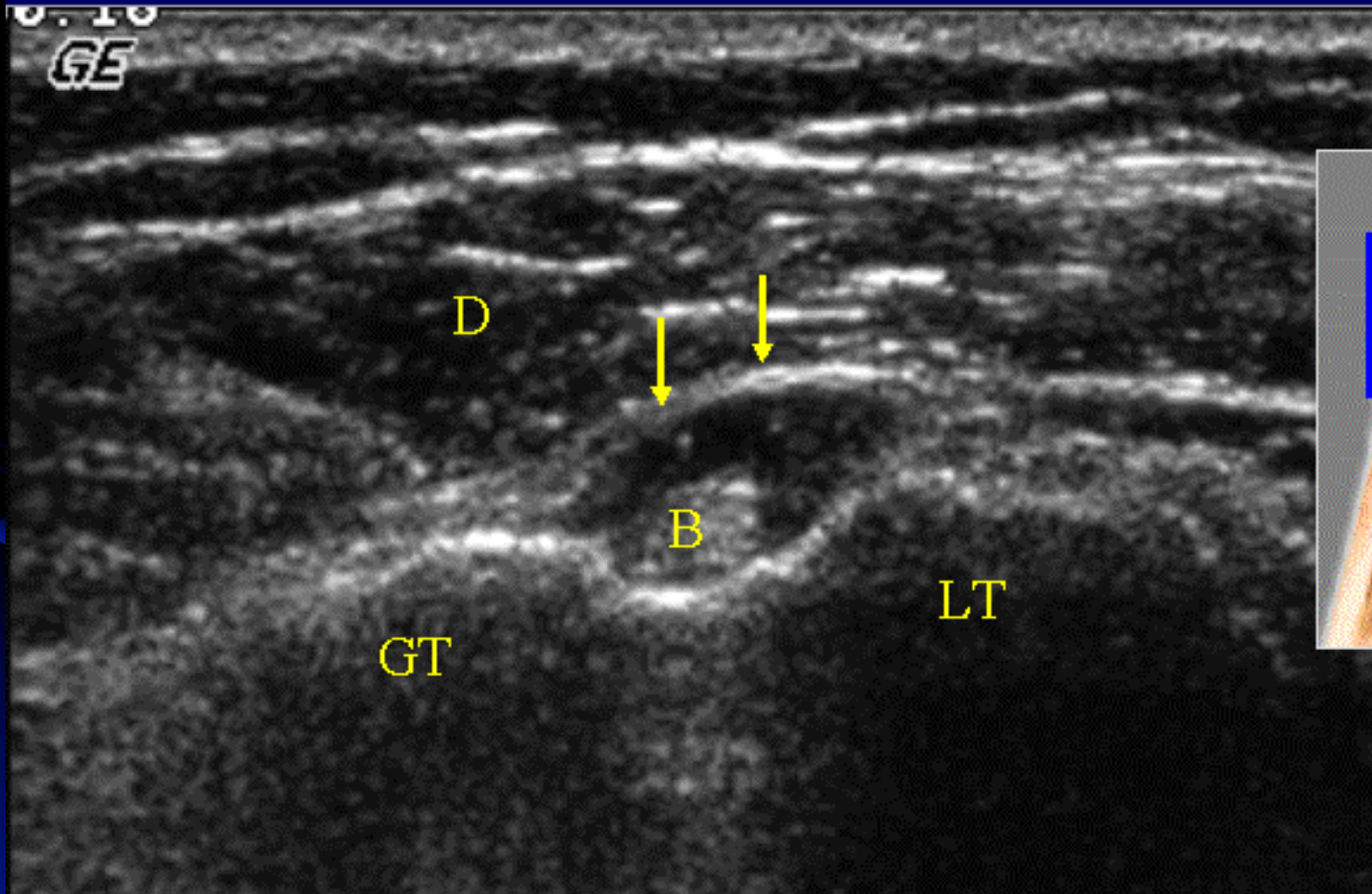


Biceps tendon

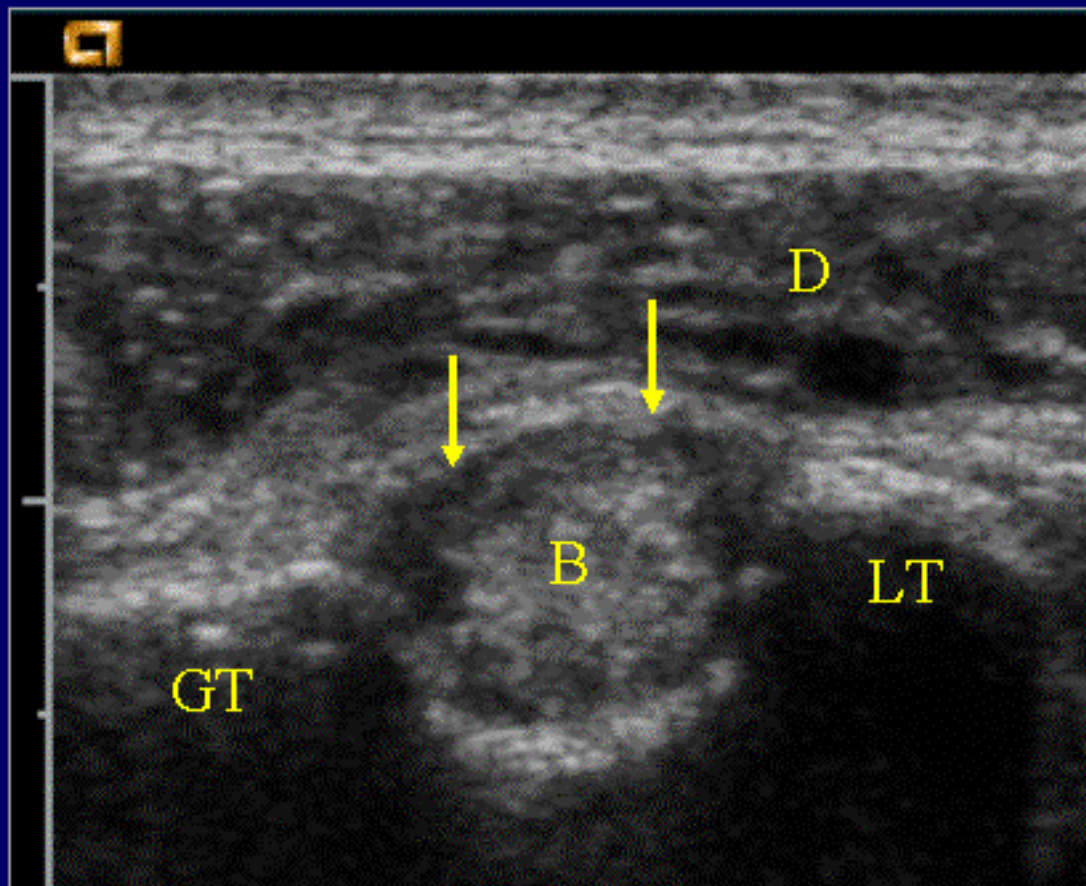




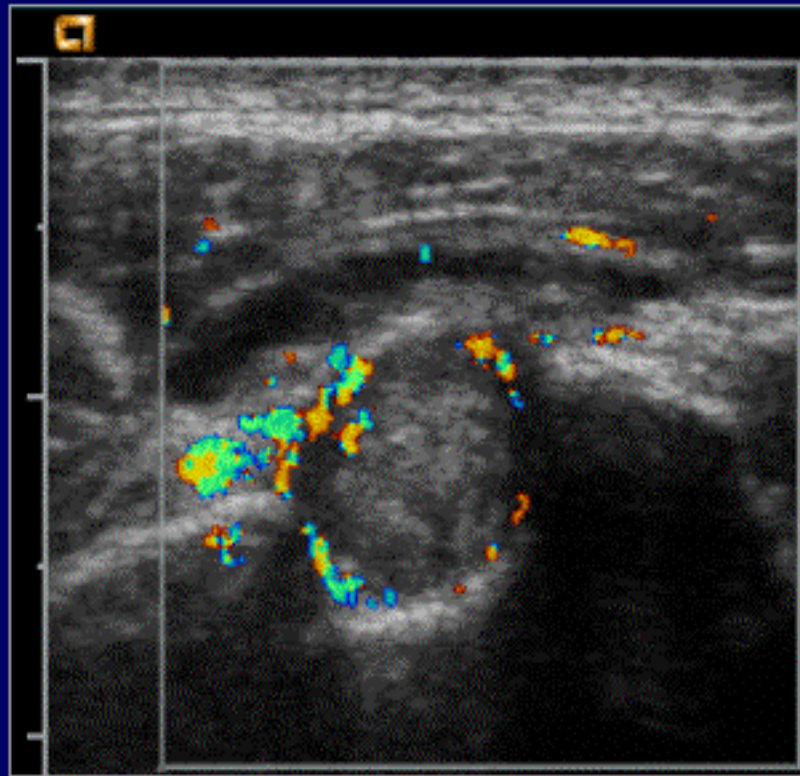
Biceps tendon effusion



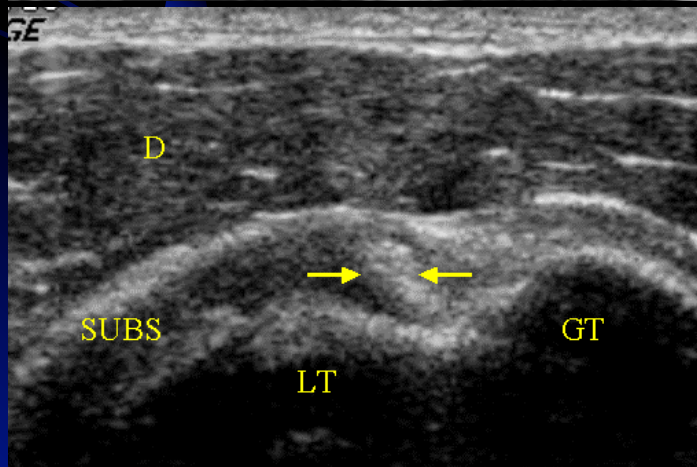
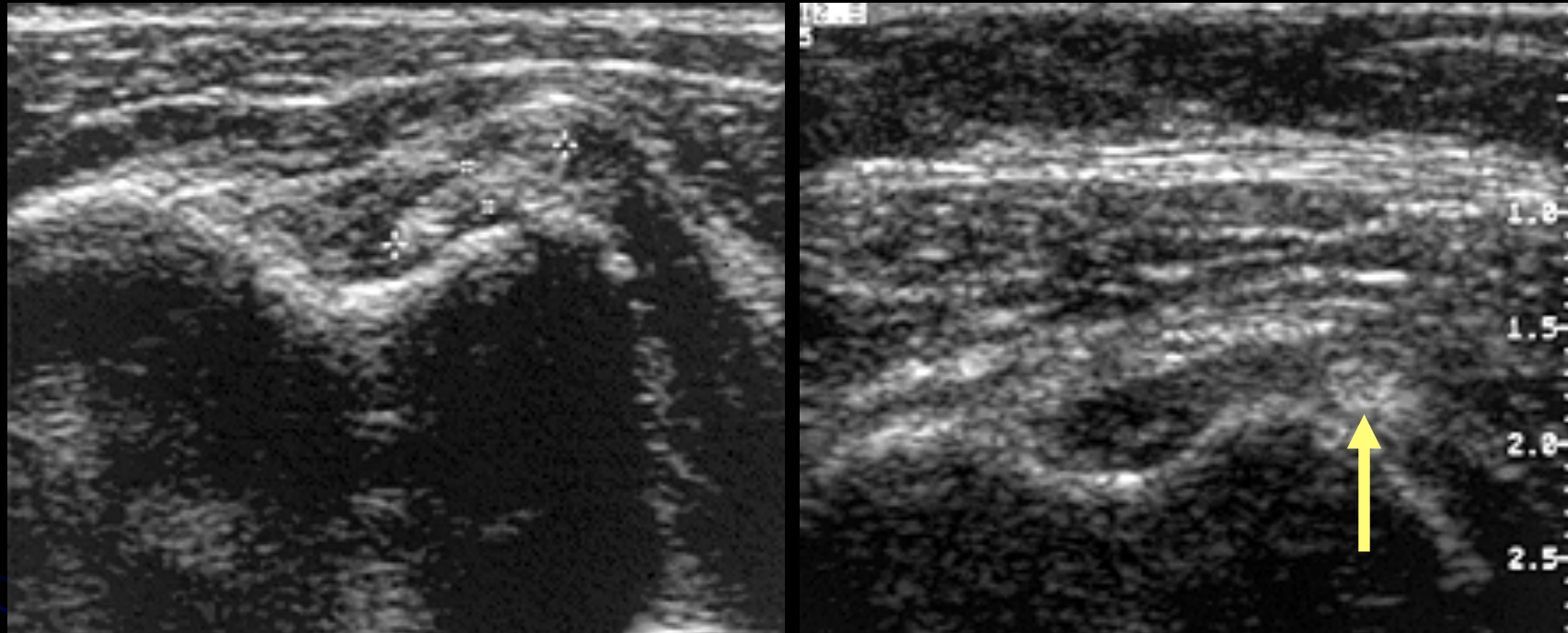
Biceps tenosynovitis (a)



(b) Biceps tenosynovitis



Biceps tendon subluxation and dislocation

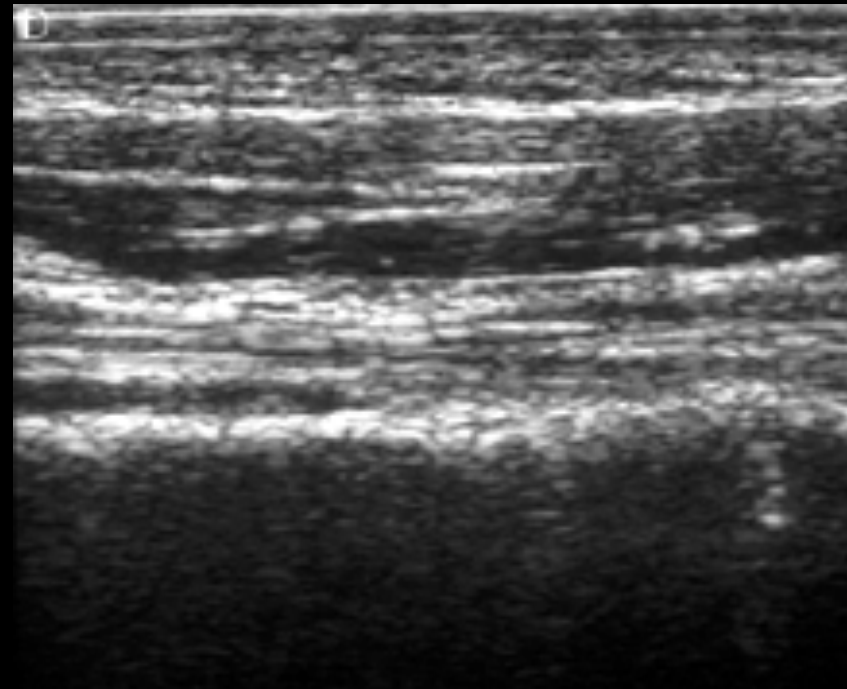
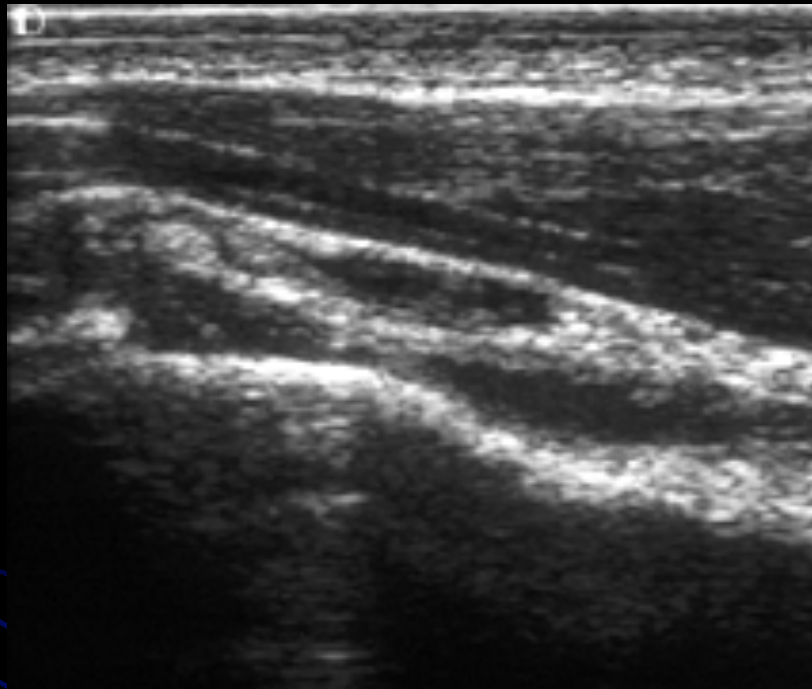


Normal bicep tendon





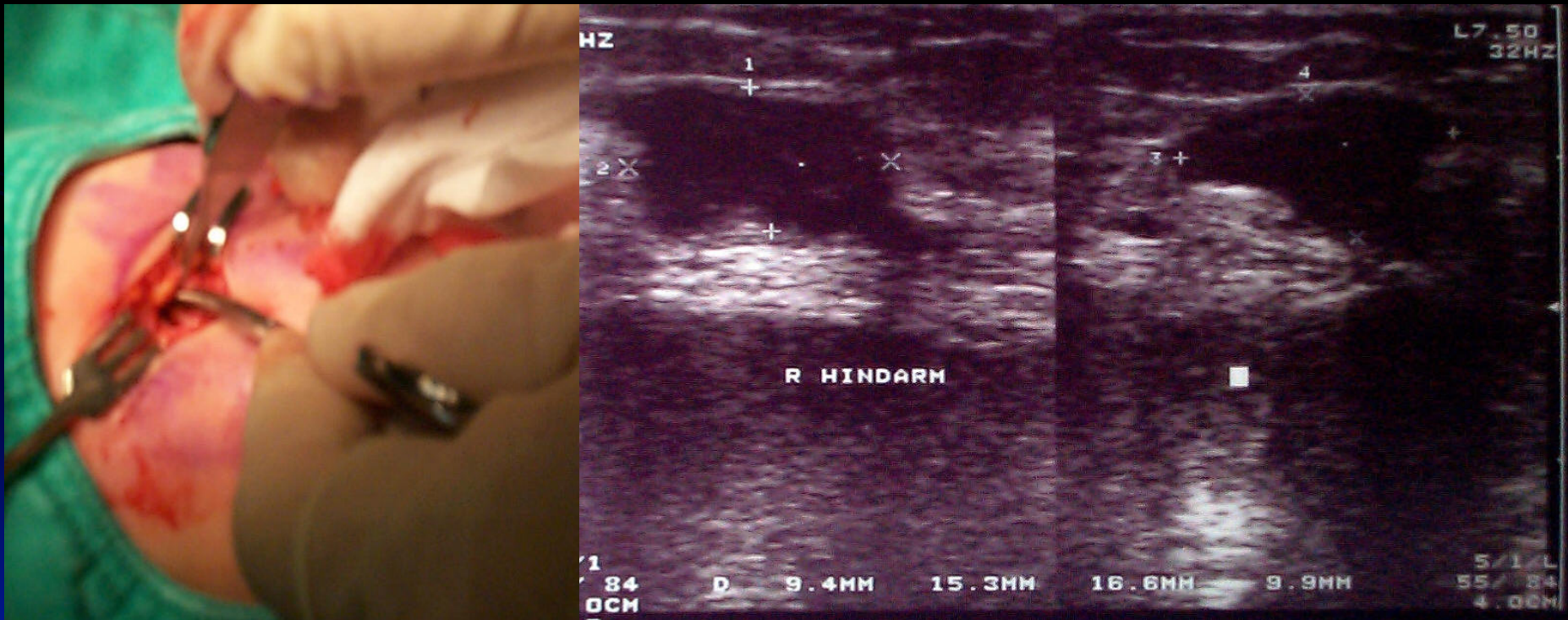
A focal injury to the left biceps tendon



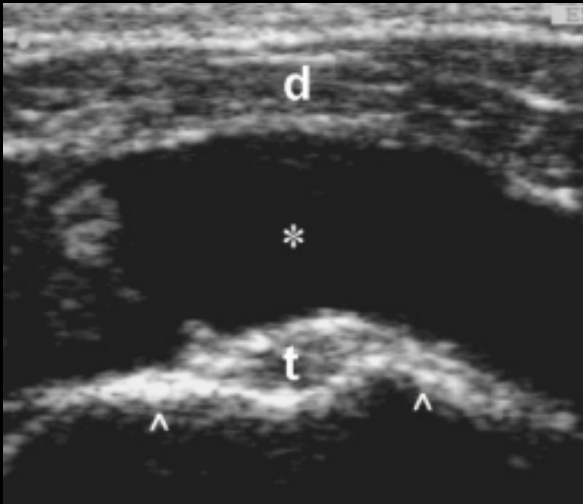
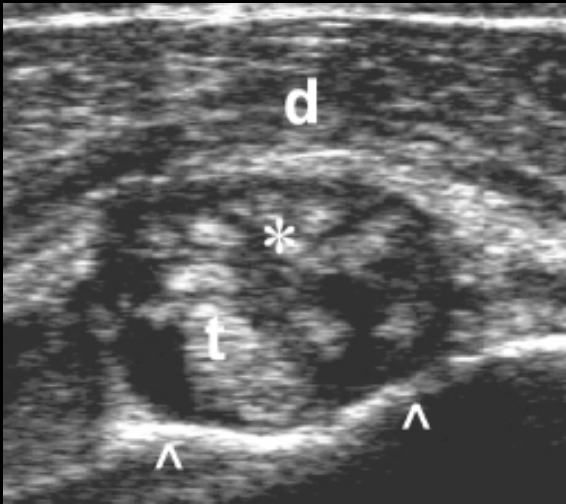
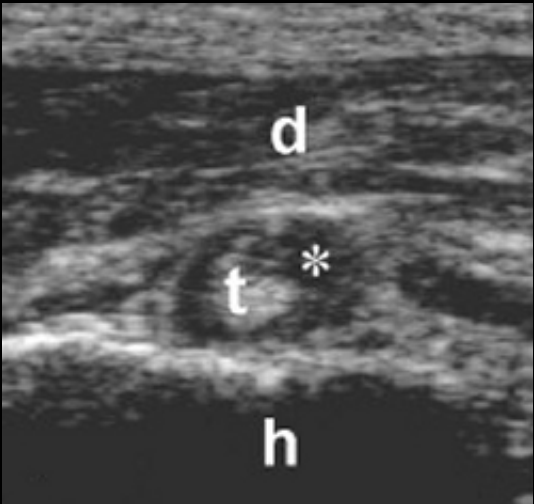
normal appearance to the right biceps tendon



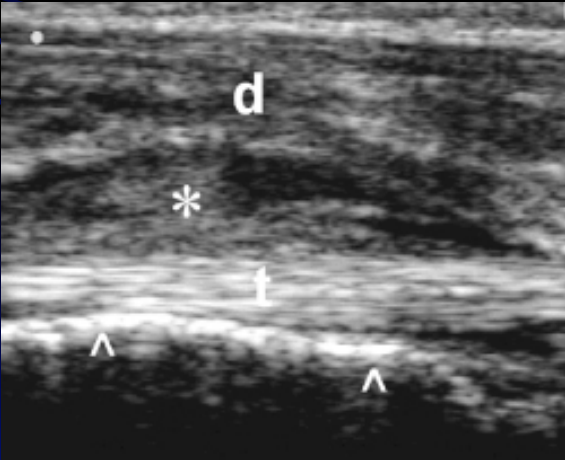
Bicep bursitis



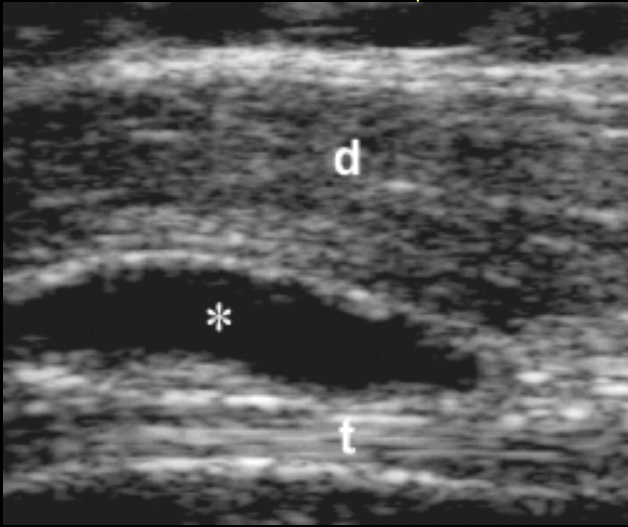
RA & Polymyalgia Rheumatica



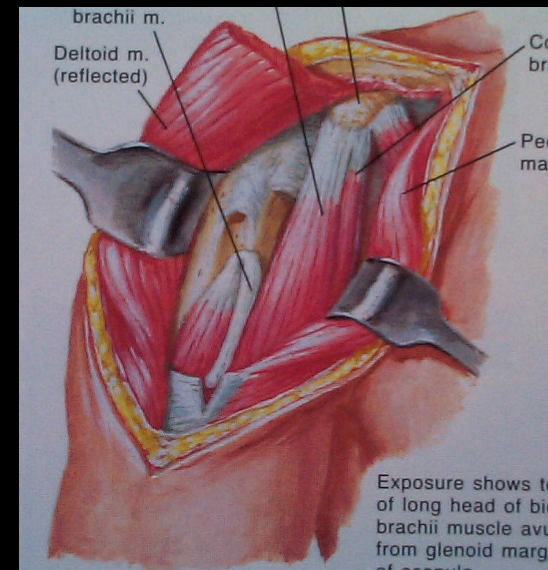
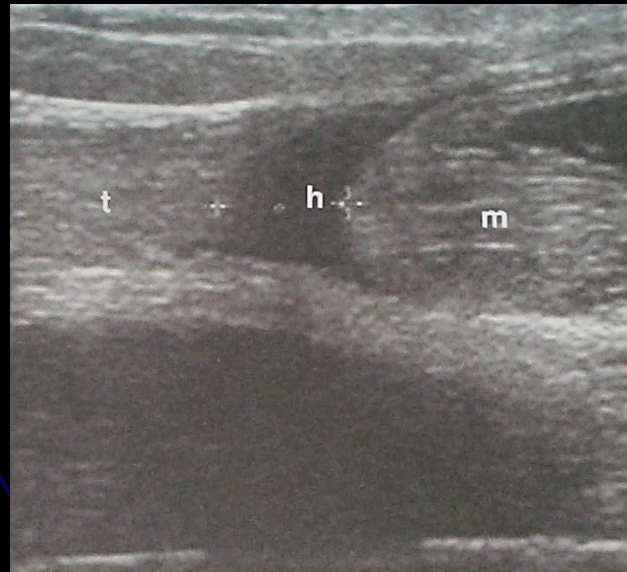
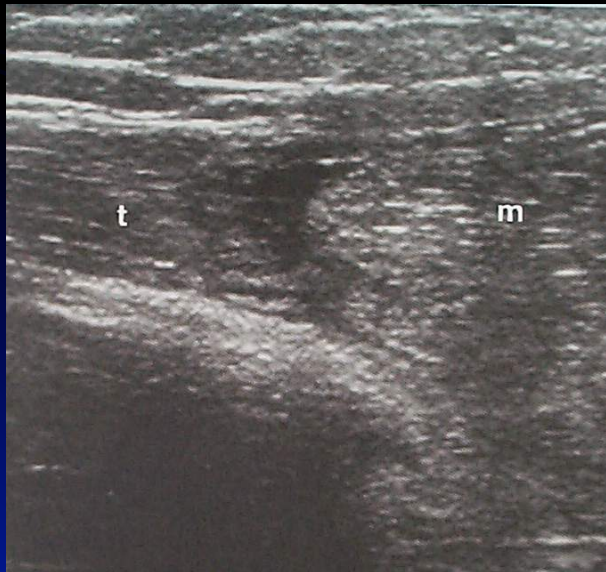
Bicep trans



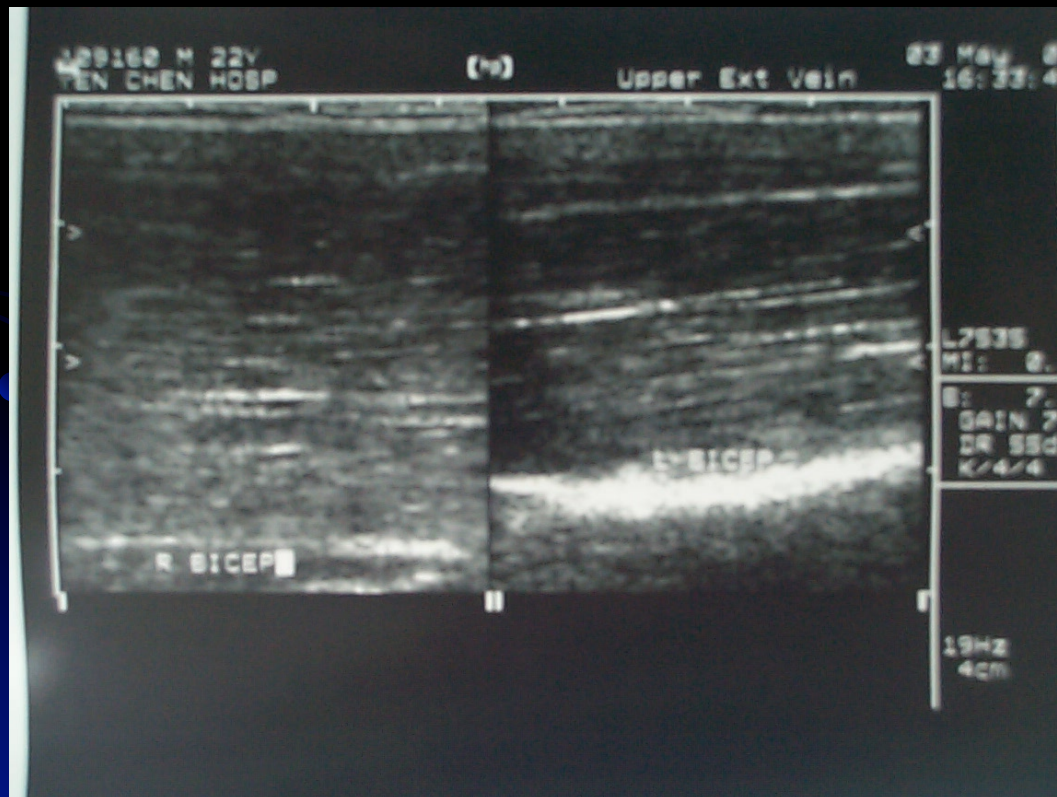
Bicep sag



Biceps rupture – Popeye sign

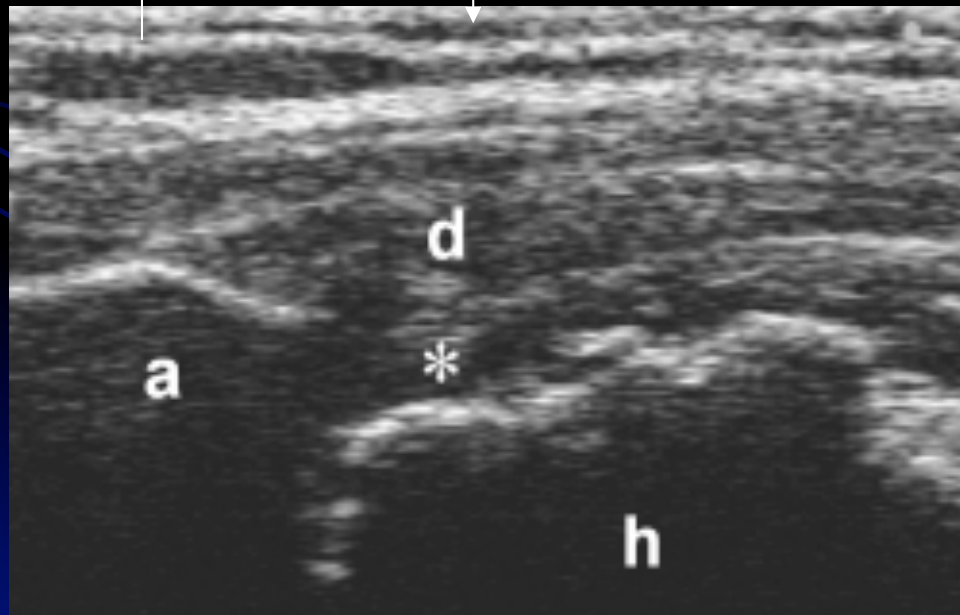


Bicep myositis

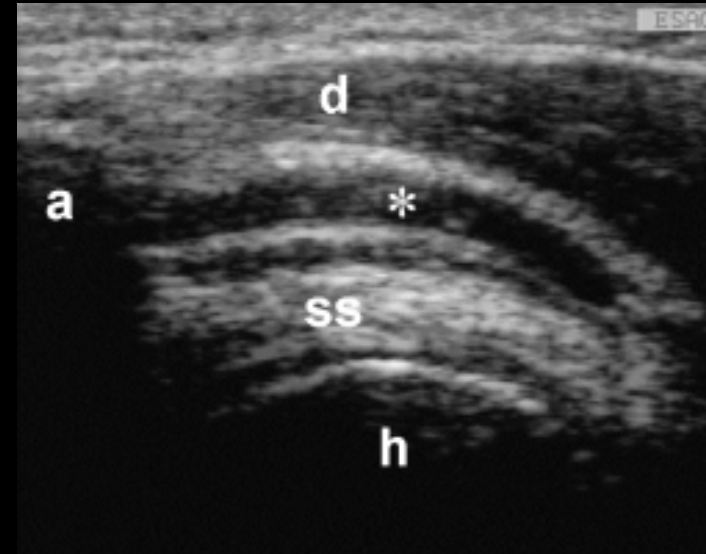


RA

Supraspinatus

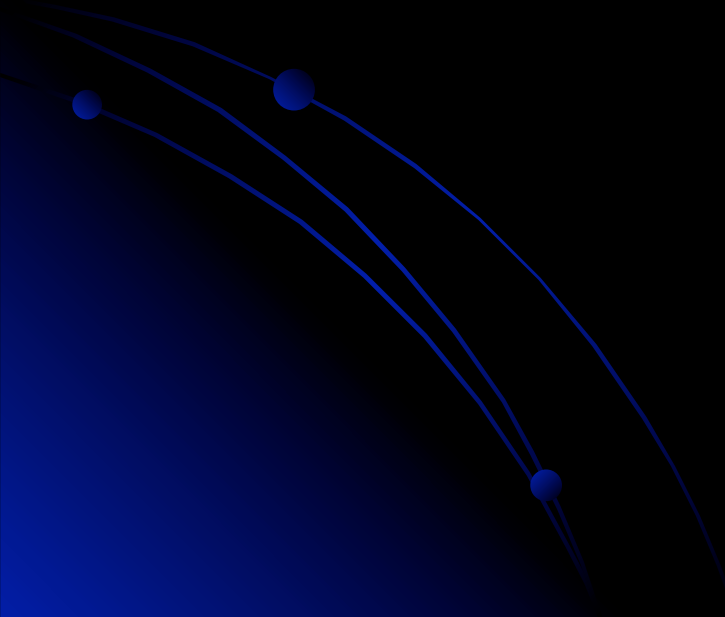


**Psoriatic
arthritis**



Normal







Rot ext



Rot int



Rot 0

1X



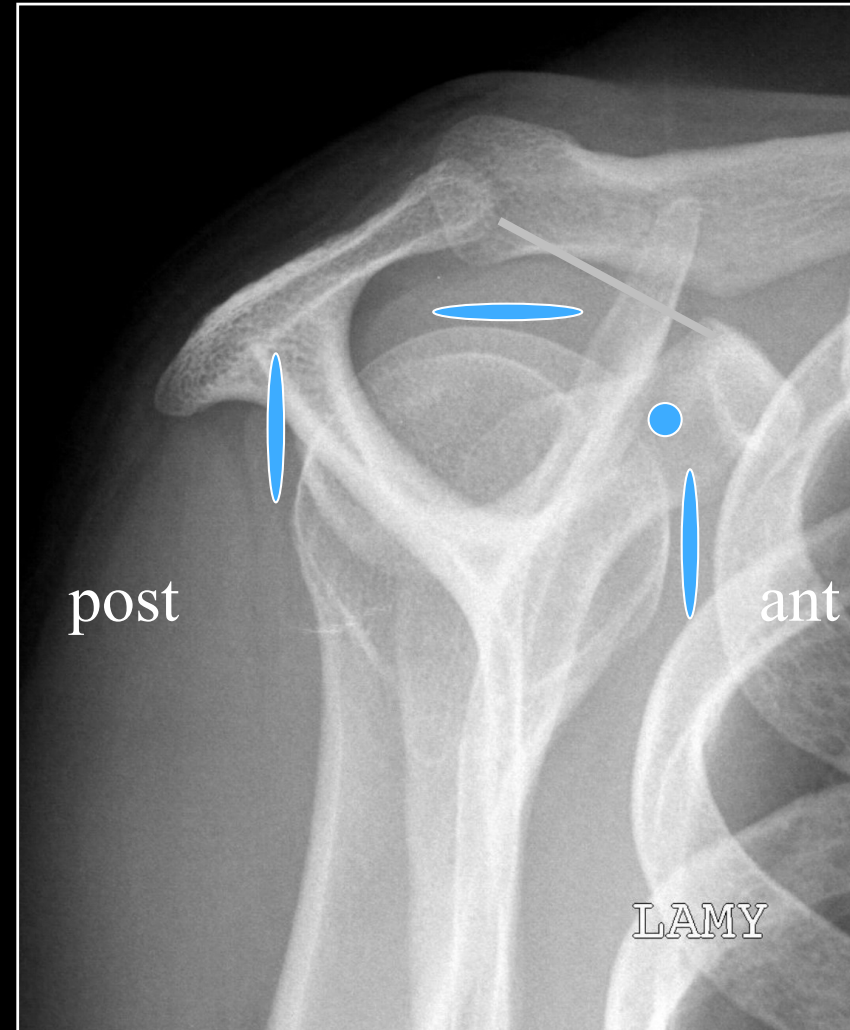
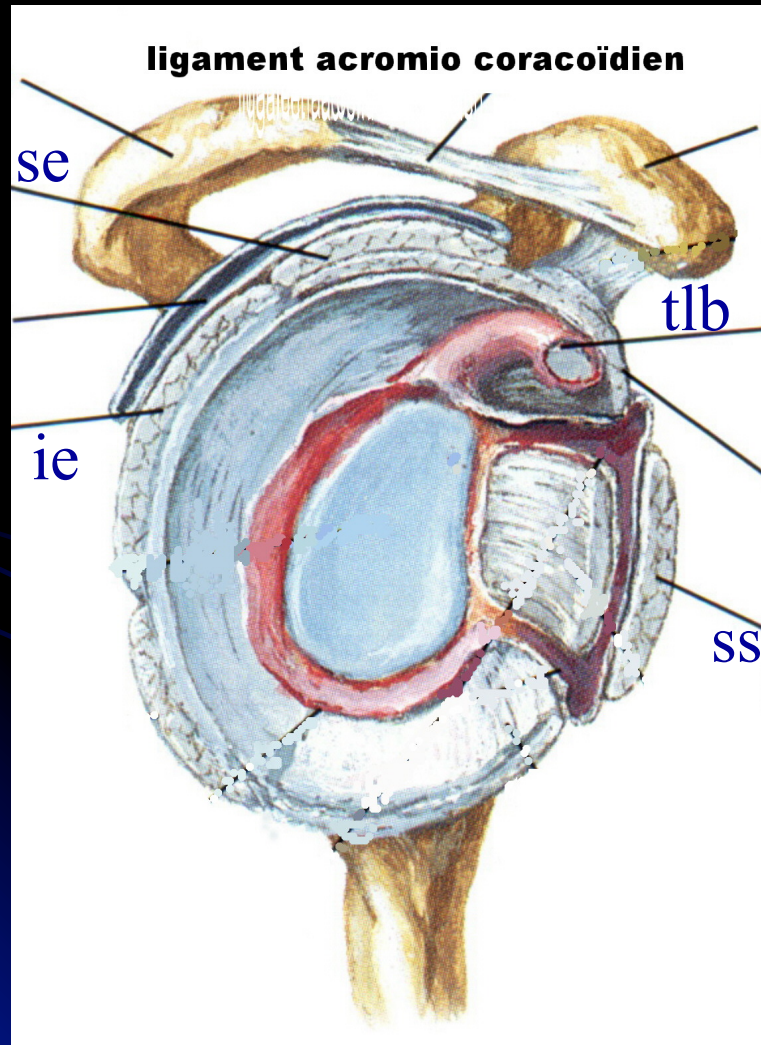
ACC

**BILAN
COIFFE**



Lamy

Profil de coiffe



Biceps muscle



Long head goes over the top of the humeral head

- Goes thru bicipital groove
- Passes thru rotator cuff under acromion
- Intra-articular
- Attaches to superior glenoid
- Depresses humeral head with aBduction



Flexes elbow and supinates forearm



Long head goes over the top of the humeral head

- Goes thru bicipital groove
- Passes thru rotator cuff under acromion
- Intra-articular
- Attaches to superior glenoid
- Depresses humeral head with aBduction



Flexes elbow and supinates forearm

Acute rupture—sxs/signs



May be Hx of impingement sxs

- Attrition



Lifting—sudden pain, occasional “snap”



Deformity with bunching of muscle distally

- Often ecchymosis



Tendon can sublux out of bicipital groove

Acute rupture–Rx



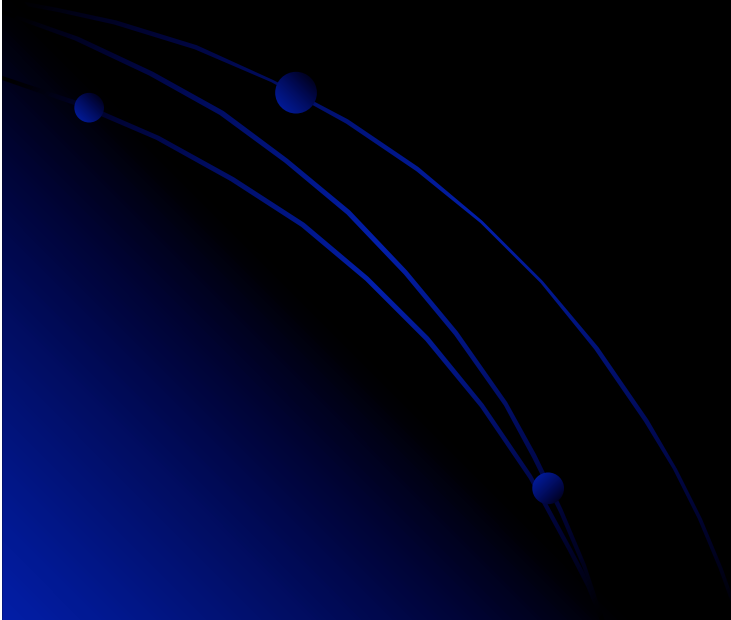
Non-operative Rx usually successful

- 10% loss of strength
- Cosmetic deformity



Occasionally repair in young laborers

- Always repair distal rupture



Biceps tendinitis–Sxs



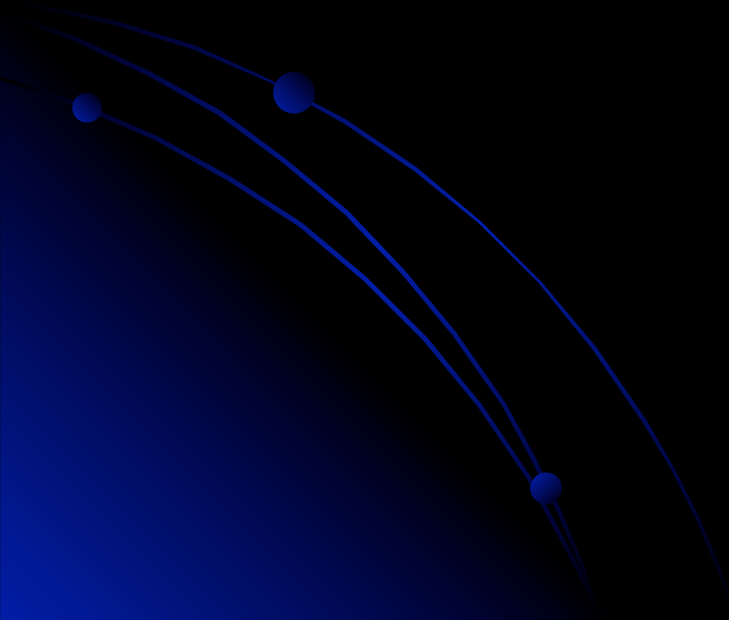
Anterior shoulder pain

- Difficult to distinguish from rotator cuff

SXS



Pain with forward elevation

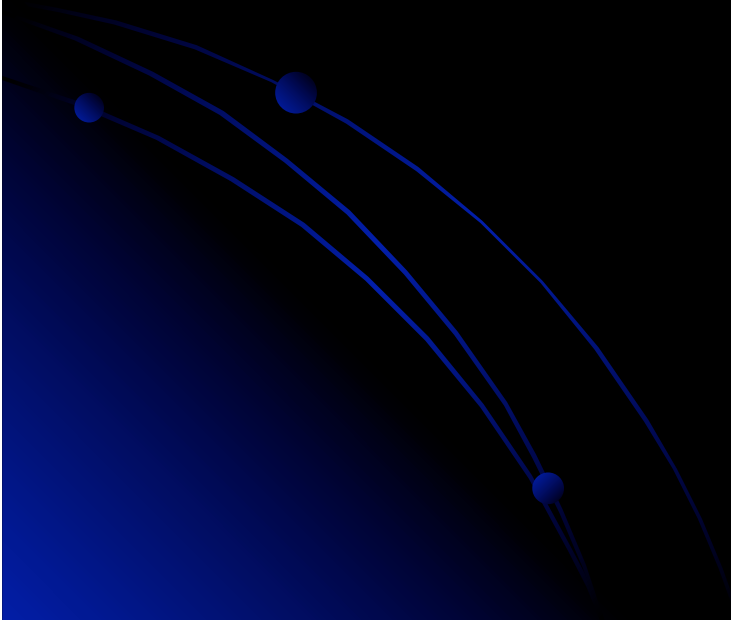


Biceps tendinitis–exam



Specific test

- Forward elevation against resistance with elbow extended and forearm supinated



Biceps tendinitis–Rx



Rest



NSAIDS

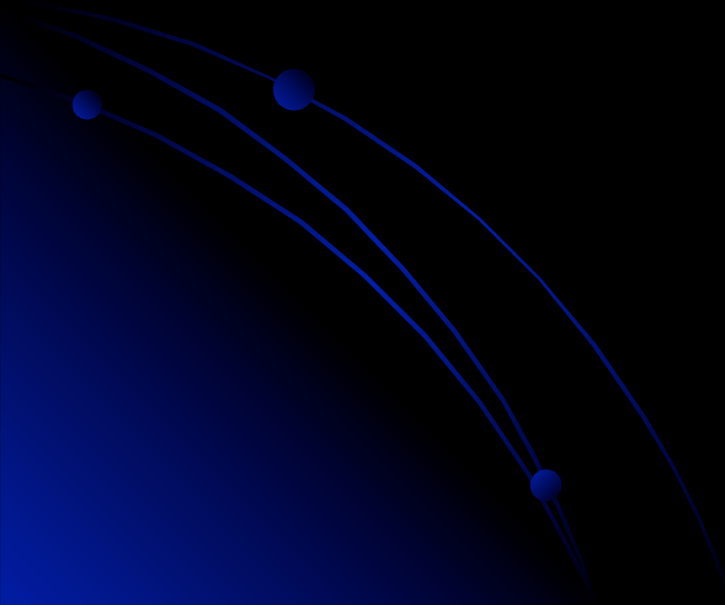


Steroid injection

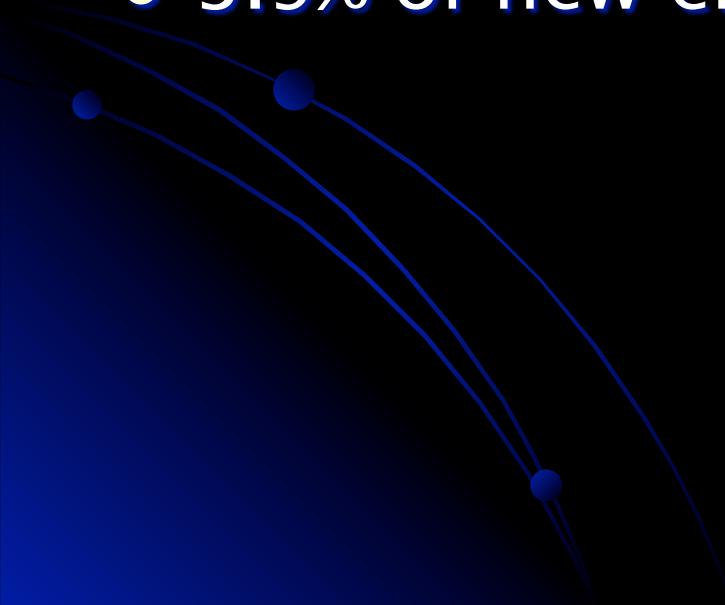
- Be careful not to inject tendon



Rarely surgery



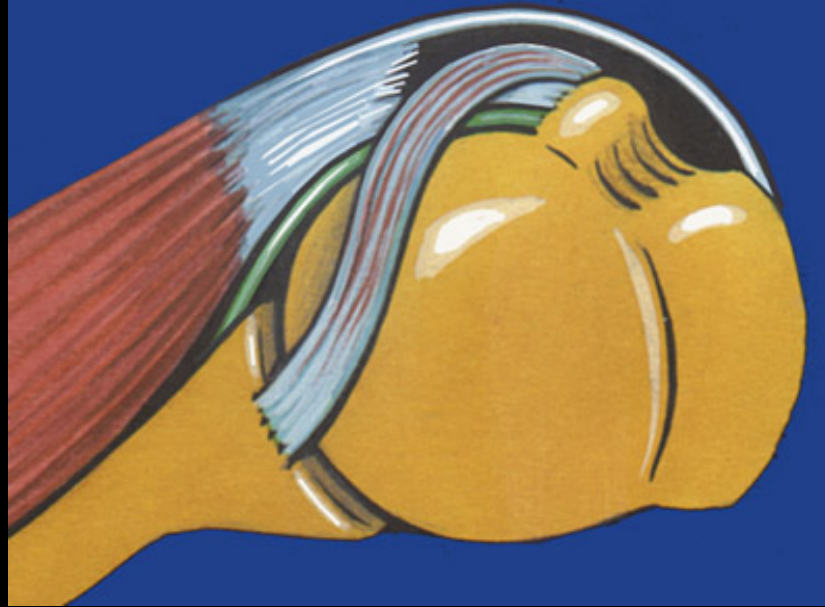
The Painful Shoulder

- common problem
 - incidence : 6.6~25 case/1000patients
 - in fourth & sixth decades
 - 8~13% of athletic injuries
 - 3.9% of new emergency department visits
- 

Degeneration limited to the CHL and RI can result in inflammation of the LHB and fraying of its superior aspect from mechanical friction of the tendon against the coracoacromial arch.

As the integrity of the CHL is lost, no intervening structures lie between the biceps tendon and the coracoacromial arch



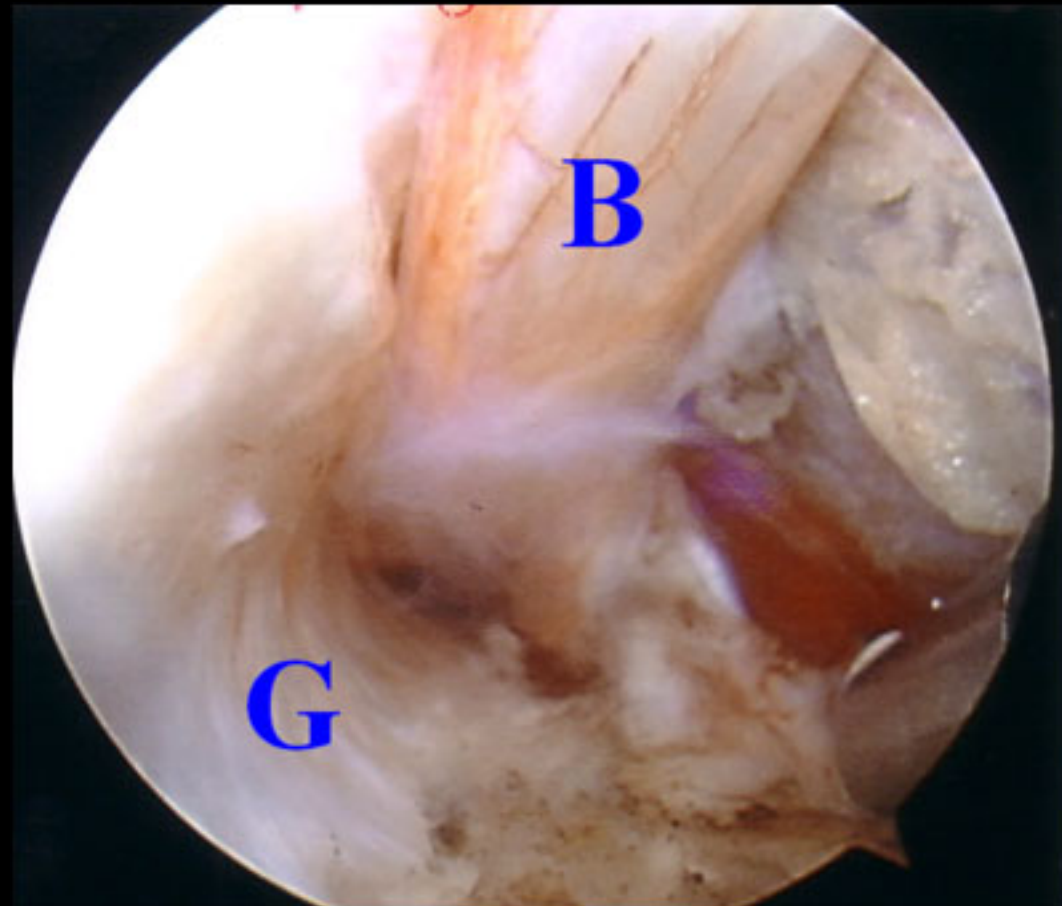


the tendon resting on the LT

Specific tests assessing biceps pathology:

Speed's test: with the forearm in a supinated position flexion is resisted and if pain at the bicipital groove is encountered the test is considered positive

Yergason's test: with the elbow flexed to 90° the forearm is actively supinated against resistance and if pain is encountered in the bicipital groove the test is considered positive



Arthroscopic illustration of inflamed tendon

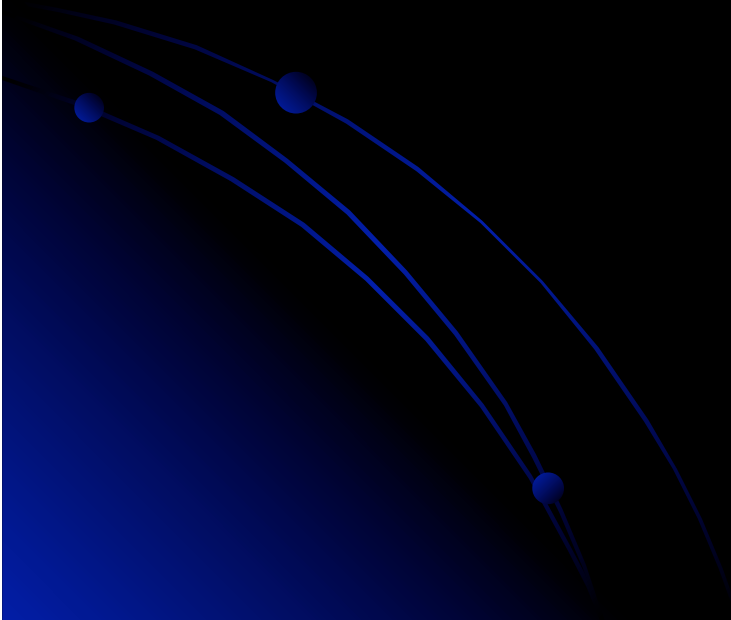
Physical examination

- localized point tenderness to palpation at the bicipital groove
- Groove: the anterior aspect of the shoulder 7 cm distal to the acromion with the arm internally rotated approximately 10°




Physical examination

- With ER the point tenderness specific travels laterally
- Subacromial-type pain will usually stay in the same location



Pulley lesions

- articular-sided supraspinatus tear
 - tear of the SGHL
 - subtle subluxation of the LHB
 - partial articular subscapularis tear.
 - labral lesion
 - anterosuperior instability
- 

4 patterns of pulley lesions (Habermeyer)

Pattern 1

isolated lesion of the SGHL

Pattern 2

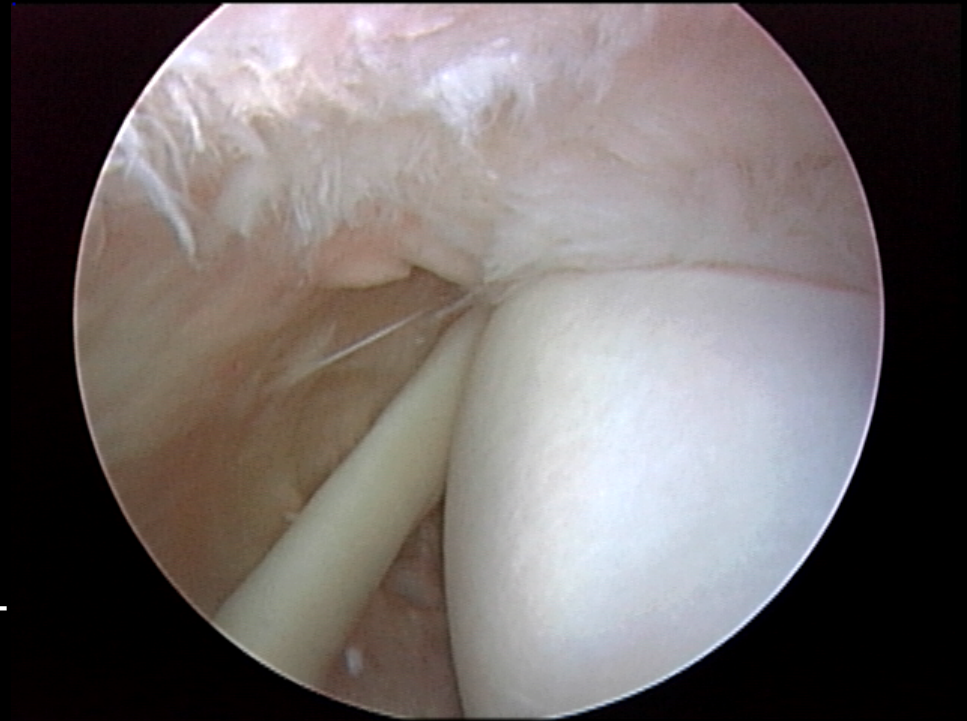
SGHL+partial articular-side SST

Pattern 3

SGHL+ deep surface tear of the SST

Pattern 4

SGHL+ partial articular-side SS and SC tendon tears



The history and the results of the physical examination are usually compatible with an impingement syndrome, although the pain may be more anterior and may radiate down the biceps itself.

